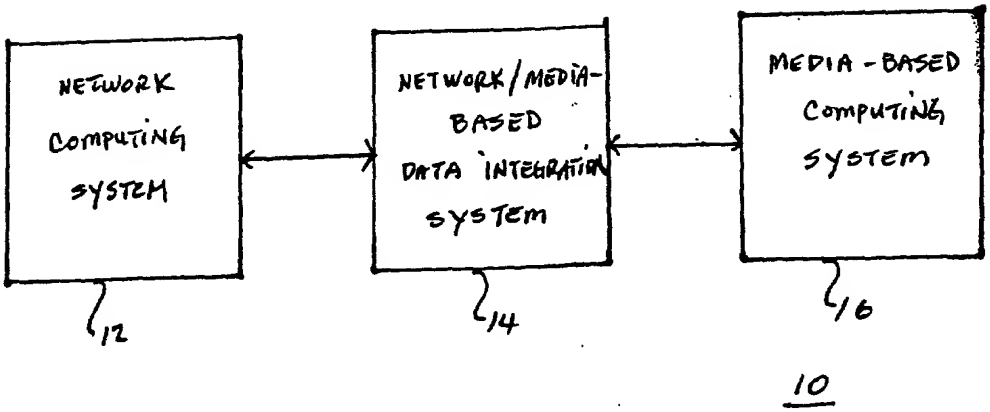
NETWORK COMPUTING SYSTEM
NETWORK/MEDIA-BASED DATA INTEGRATION SYSTEM
MEDIA-BASED COMPUTING SYSTEM
12
14
16
10

FIG. 1A

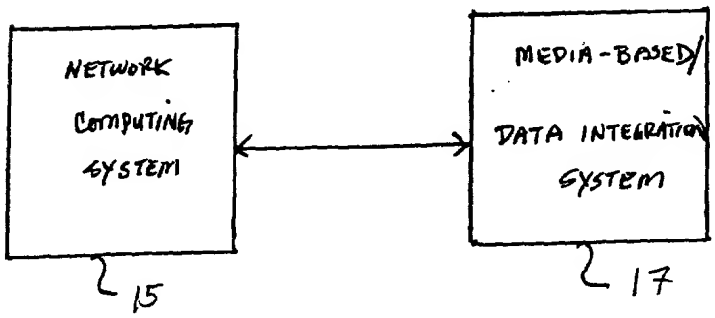
NETWORK COMPUTING SYSTEM
MEDIA-BASED DATA INTEGRATION SYSTEM
15
17
19

FIG. 1B

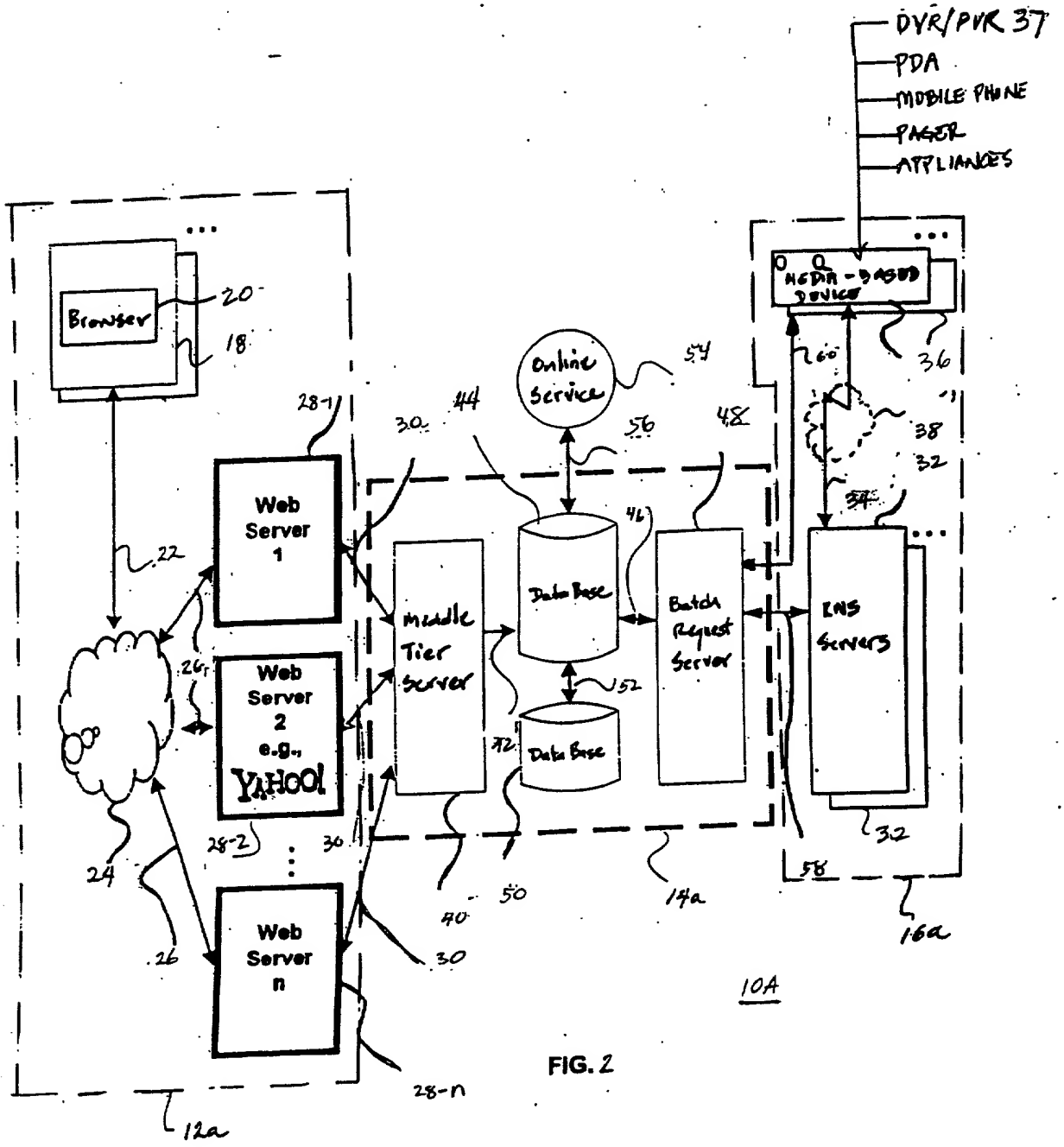
DVR/PVR 37
PDA
MOBILE PHONE
PAGER
APPLIANCES
Browser
20
18
Online Service
54
Web Server 1
Web Server 2 e.g., YAHOO!
Web Server n
Middle Tier Server
Data Base
Data Base
Batch Request Server
EMS Servers
22
24
26
28-1
28-2
28-n
30
32
34
36
38
40
44
46
48
50
52
56
58
60
12a
14a
16a
10A

FIG. 2

18/28/40/32/48/36

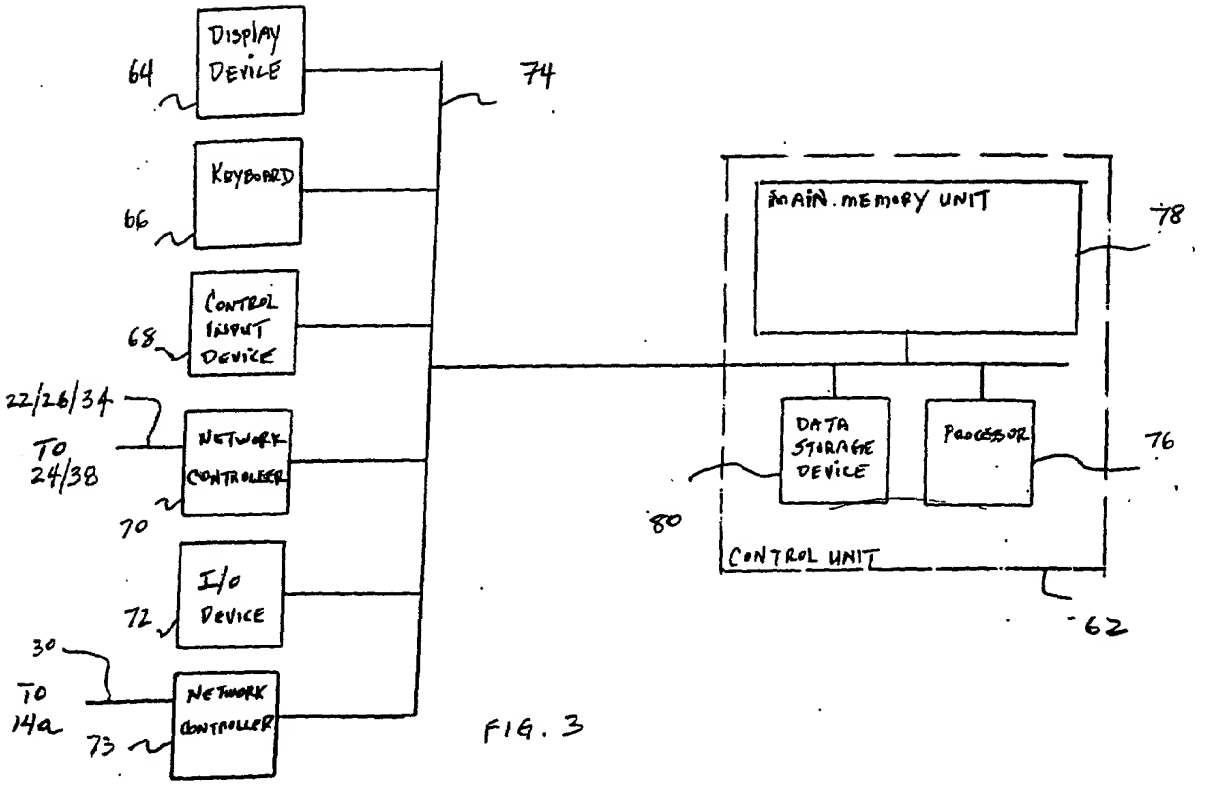

FIG. 3

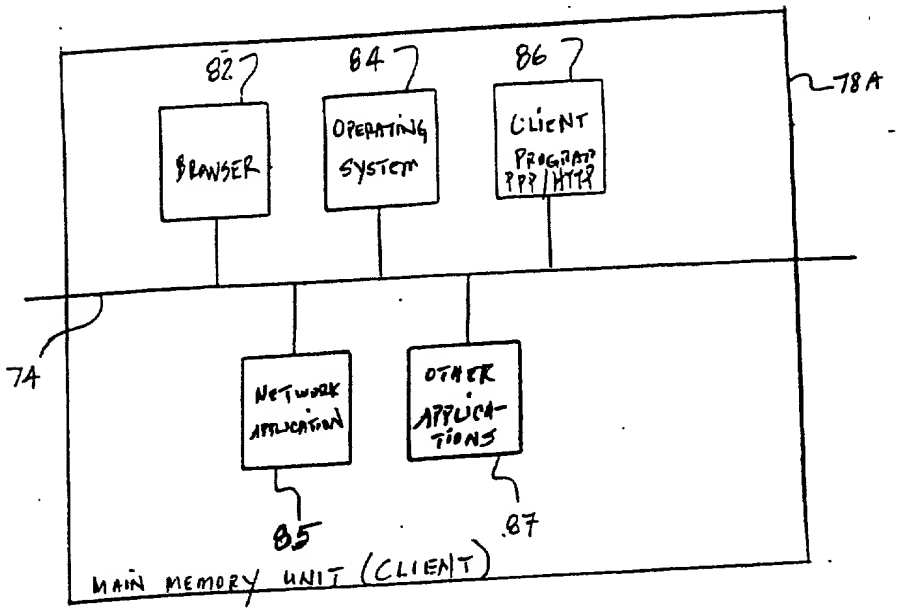
82
84
86
78A
BROWSER
OPERATING SYSTEM
CLIENT PROGRAMS PPP/HTTP
74
NETWORK APPLICATION
OTHER APPLICATIONS
85
87
MAIN MEMORY UNIT (CLIENT)

FIG. 4A

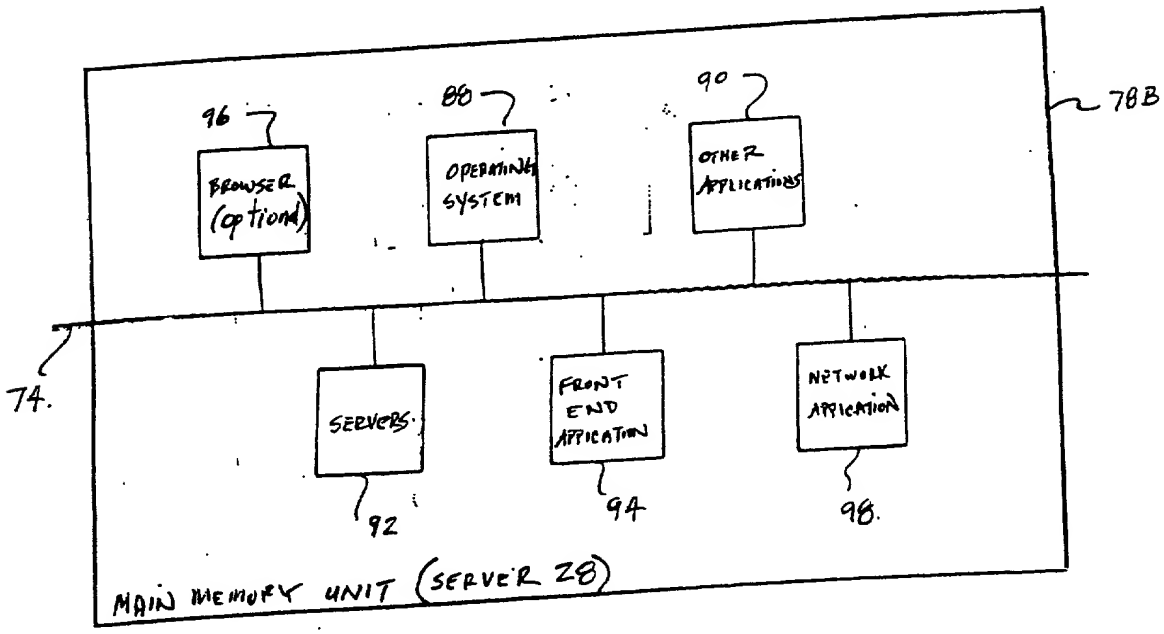
96
88
90
78B
BROWSER (optional)
OPERATING SYSTEM
OTHER APPLICATIONS
74
SERVERS
FRONT END APPLICATION
NETWORK APPLICATION
92
94
98
MAIN MEMORY UNIT (SERVER 28)

FIG. 4B

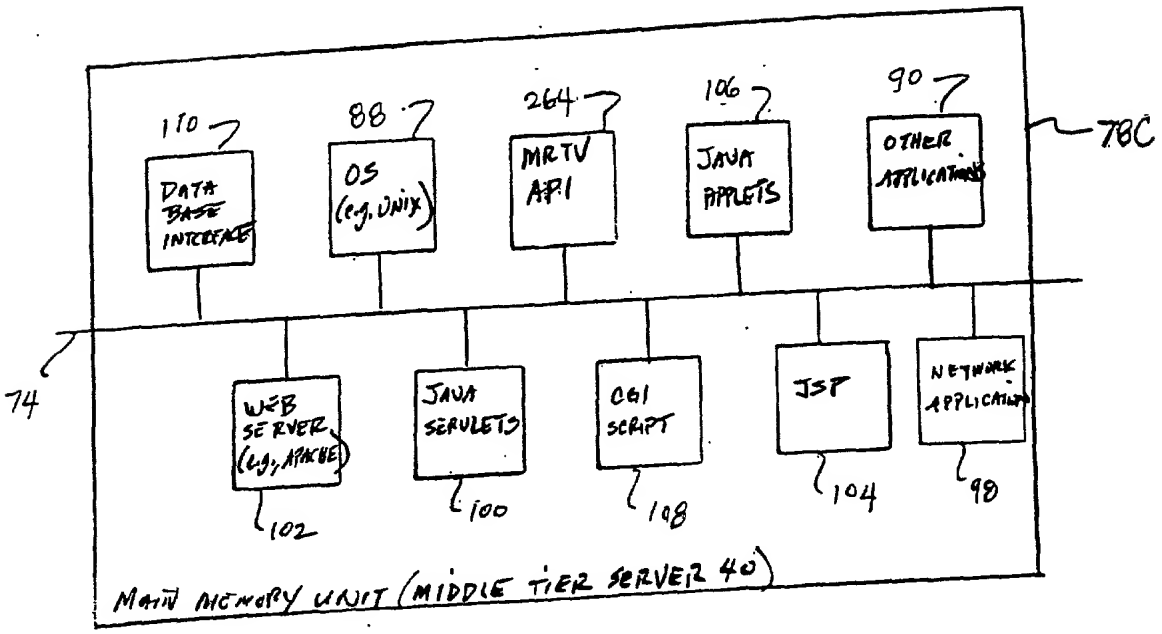
110
DATA BASE INTERFACE
88
OS (e.g. UNIX)
264
MRTV API
106
JAVA APPLETS
90
OTHER APPLICATIONS
78C
74
WEB SERVER (e.g. APACHE)
JAVA SERVLETS
CGI SCRIPT
JSP
NETWORK APPLICATION
102
100
108
104
98
MAIN MEMORY UNIT (MIDDLE TIER SERVER 40)

FIG. 4C

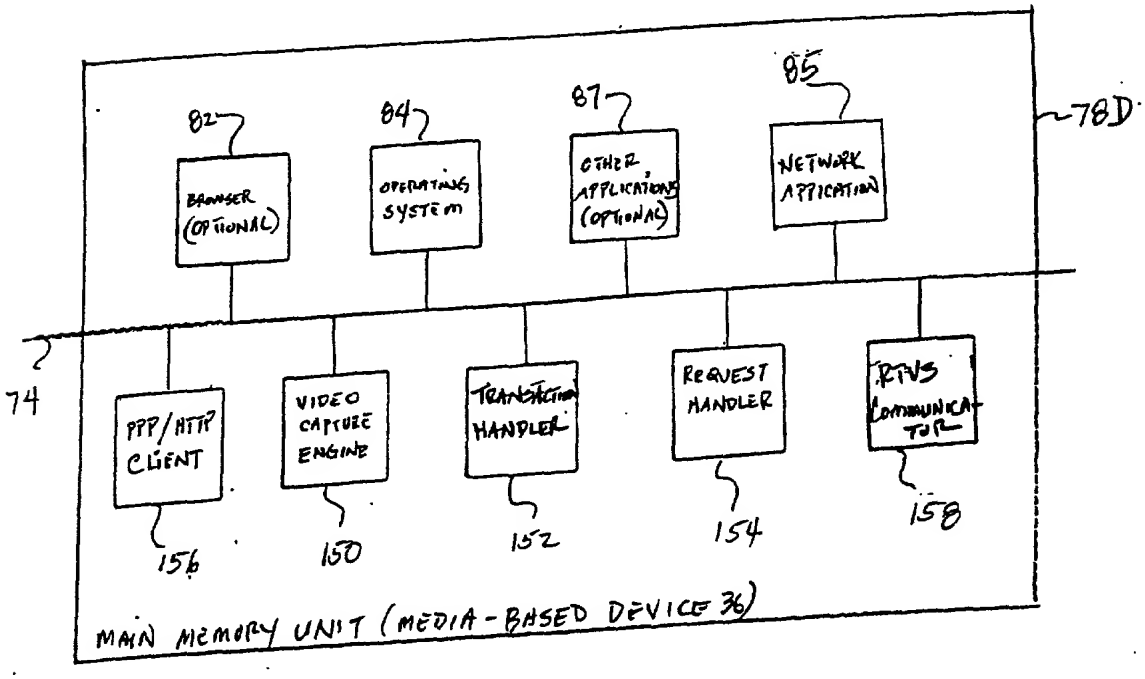
82
BROWSER (OPTIONAL)
84
OPERATING SYSTEM
87
OTHER APPLICATIONS (OPTIONAL)
85
NETWORK APPLICATION
78D
74
PPP/HTTP CLIENT
VIDEO CAPTURE ENGINE
TRANSACTION HANDLER
REQUEST HANDLER
RTVS COMMUNICATOR
156
150
152
154
158
MAIN MEMORY UNIT (MEDIA-BASED DEVICE 36)

FIG. 4D

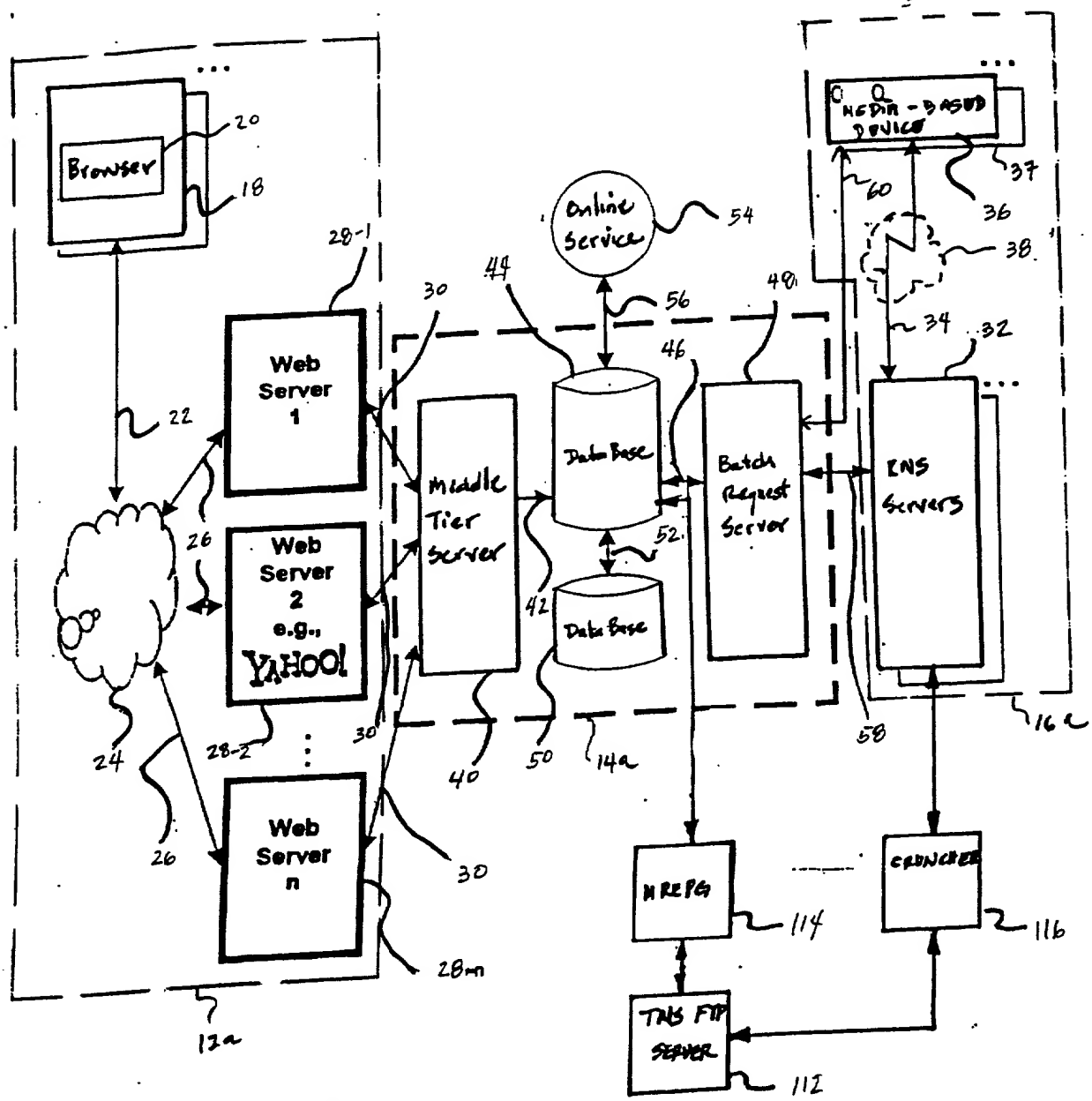
Browser
20
18
Web Server 1
Web Server 2 e.g., YAHOO!
Web Server n
28-1
28-2
28n
22
24
26
30
Middle Tier Server
Data Base
Data Base
Online Service
54
44
56
46
48
42
52
40
50
14a
12a
Batch Request Server
ENS Servers
16a
58
60
36
37
38
34
32
NEDIR-BASED DEVICE
NREPG
114
CRONCHER
116
TMS FTP SERVER
112

FIG. 5

10B

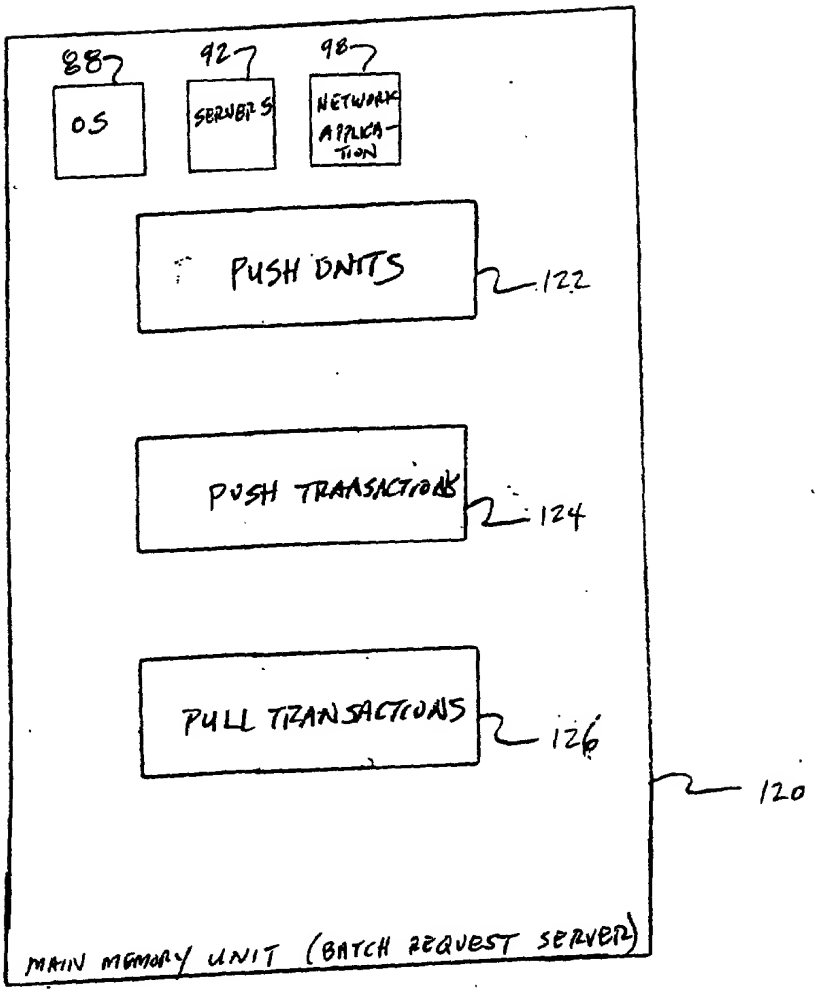
88
OS
92
SERVERS
98
NETWORK APPLICATION
PUSH UNITS
122
PUSH TRANSACTIONS
124
PULL TRANSACTIONS
126
120
MAIN MEMORY UNIT (BATCH REQUEST SERVER)

FIG. 6

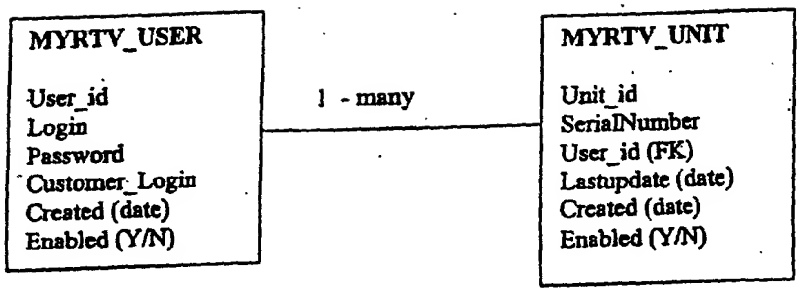
MYRTV_USER
User_id
Login
Password
Customer_Login
Created (date)
Enabled (Y/N)
1 - many
MYRTV_UNIT
Unit_id
SerialNumber
User_id (FK)
Lastupdate (date)
Created (date)
Enabled (Y/N)

FIG. 7

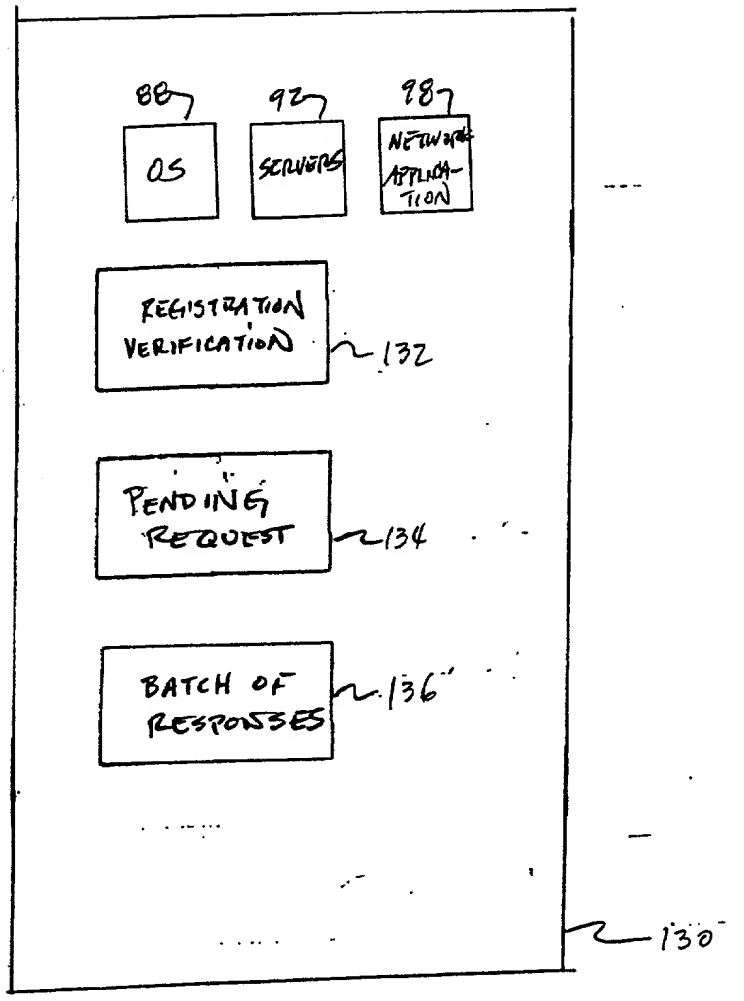
88
92
98
OS
SERVERS
NETWORK APPLICATION
REGISTRATION VERIFICATION
132
PENDING REQUEST
134
BATCH OF RESPONSES
136
130

FIG. 8

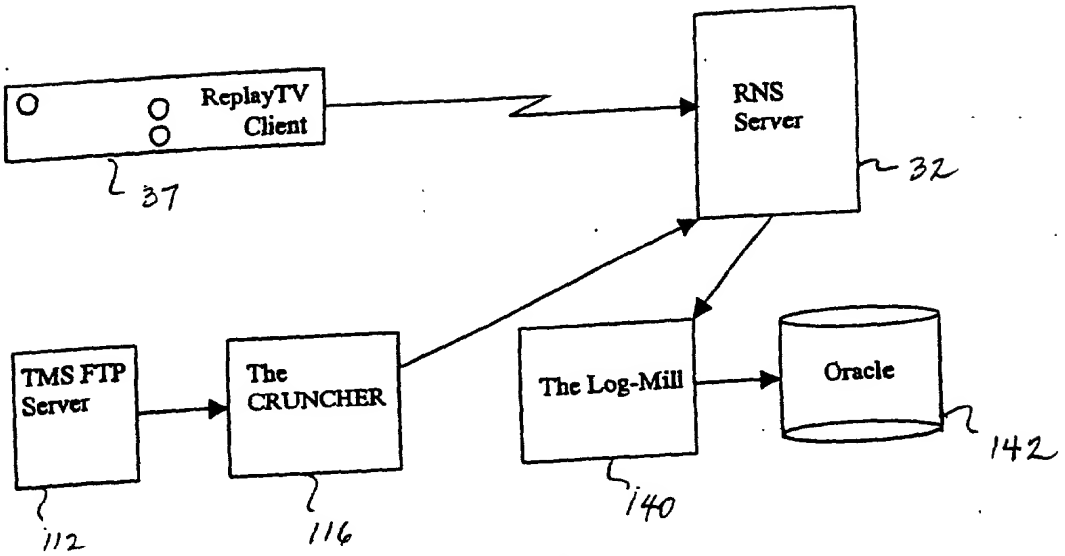
ReplayTV Client
37
RNS Server
32
TMS FTP Server
112
The CRUNCHER
116
The Log-Mill
140
Oracle
142

FIG. 9

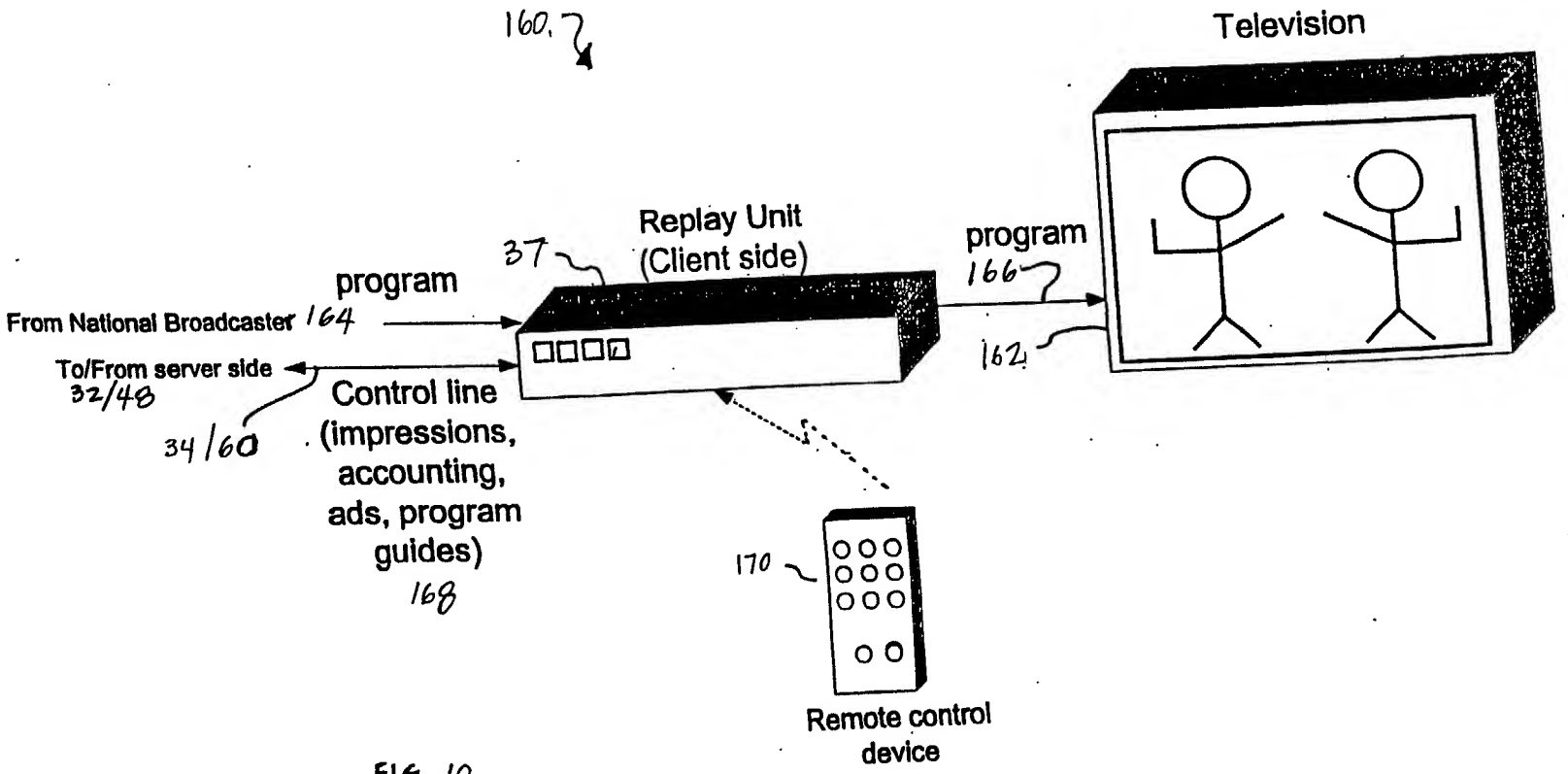
160
Television
Replay Unit
(Client side)
37
program
166
program
164
From National Broadcaster
To/From server side
32/48
34/60
Control line
(impressions,
accounting,
ads, program
guides)
168
162
170
Remote control
device

FIG. 10

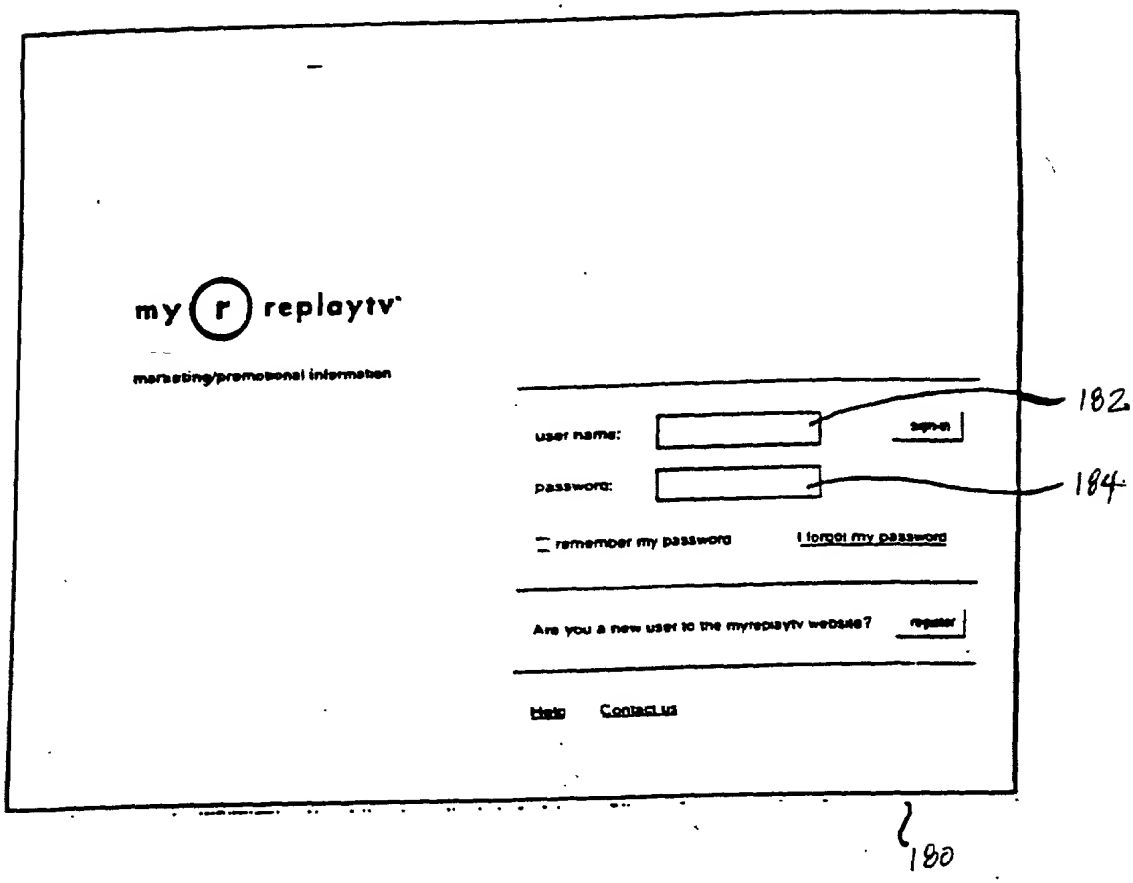
my r replaytv
marketing/promotional information
user name:
sign-in
password:
remember my password
I forgot my password
Are you a new user to the myreplaytv website?
register
Help
Contact us
182
184
180

FIG. 11

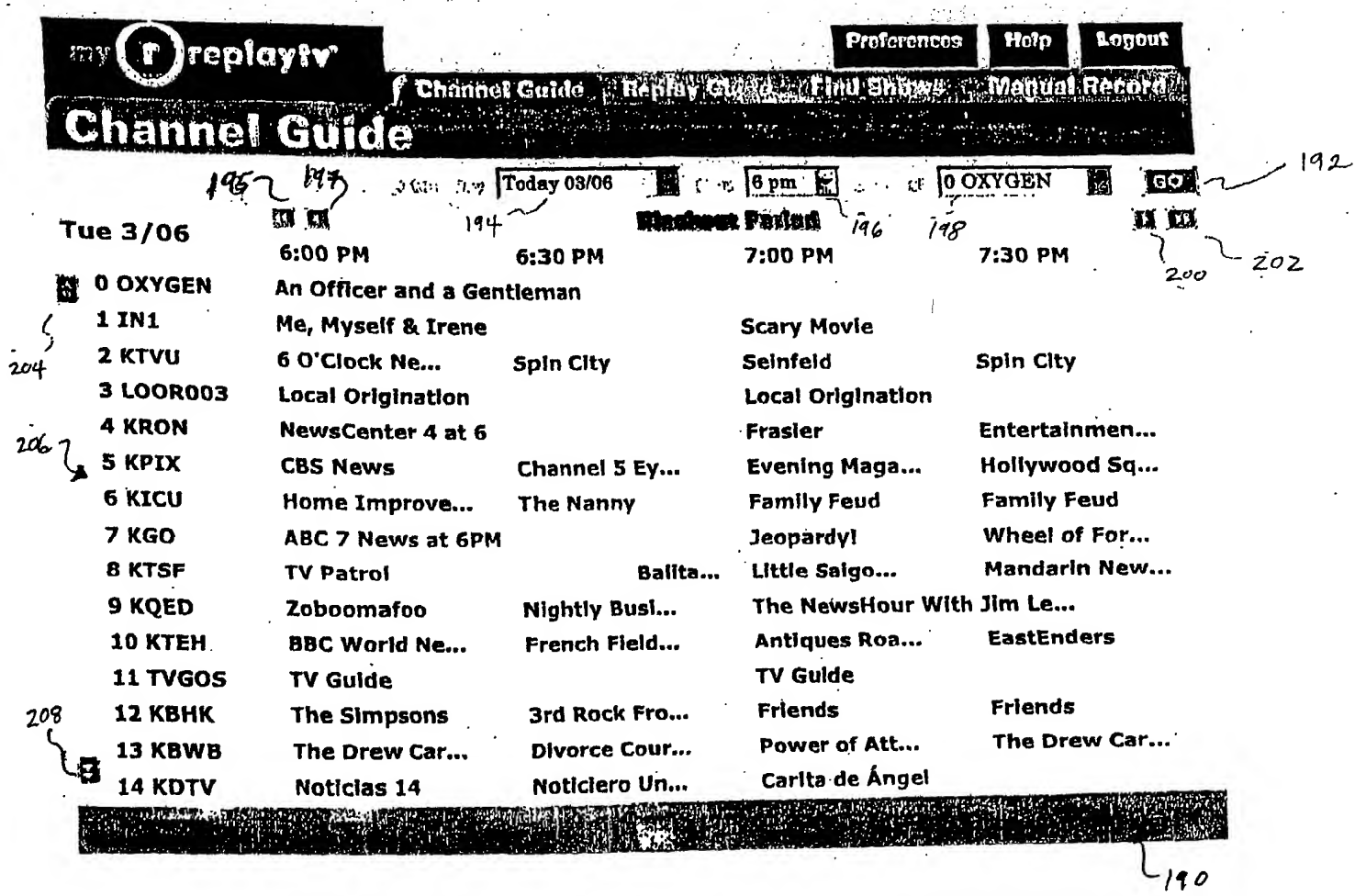

FIG. 12A

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
Sheet 13 of 31

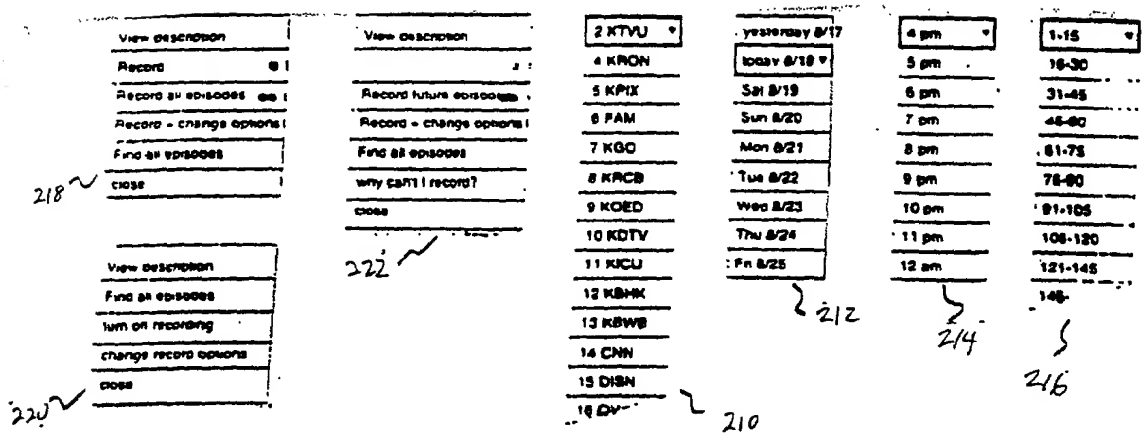

FIG. 12B

US 6,850,693 B2

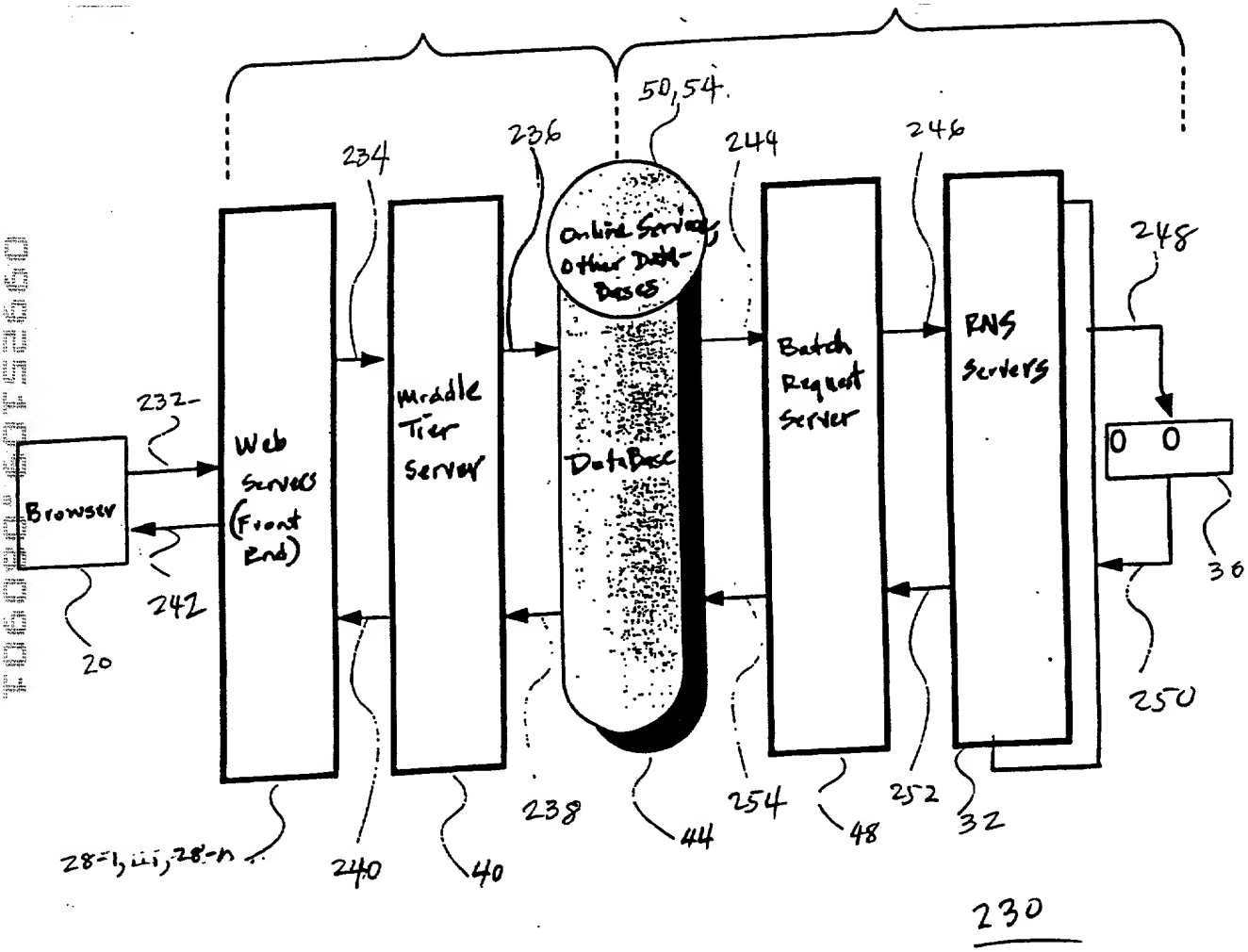
50,54
234
236
244
246
248
232
Browser
Web Servers (Front End)
Middle Tier Server
Online Services Other Data-Bases
DataBase
Batch Request Server
RNS Servers
0 0
20
242
238
44
254
48
252
32
250
36
28-1, ..., 28-n
240
40
230

FIG. 13A

EXPRESS MAIL NO. EV 339 675 520 US

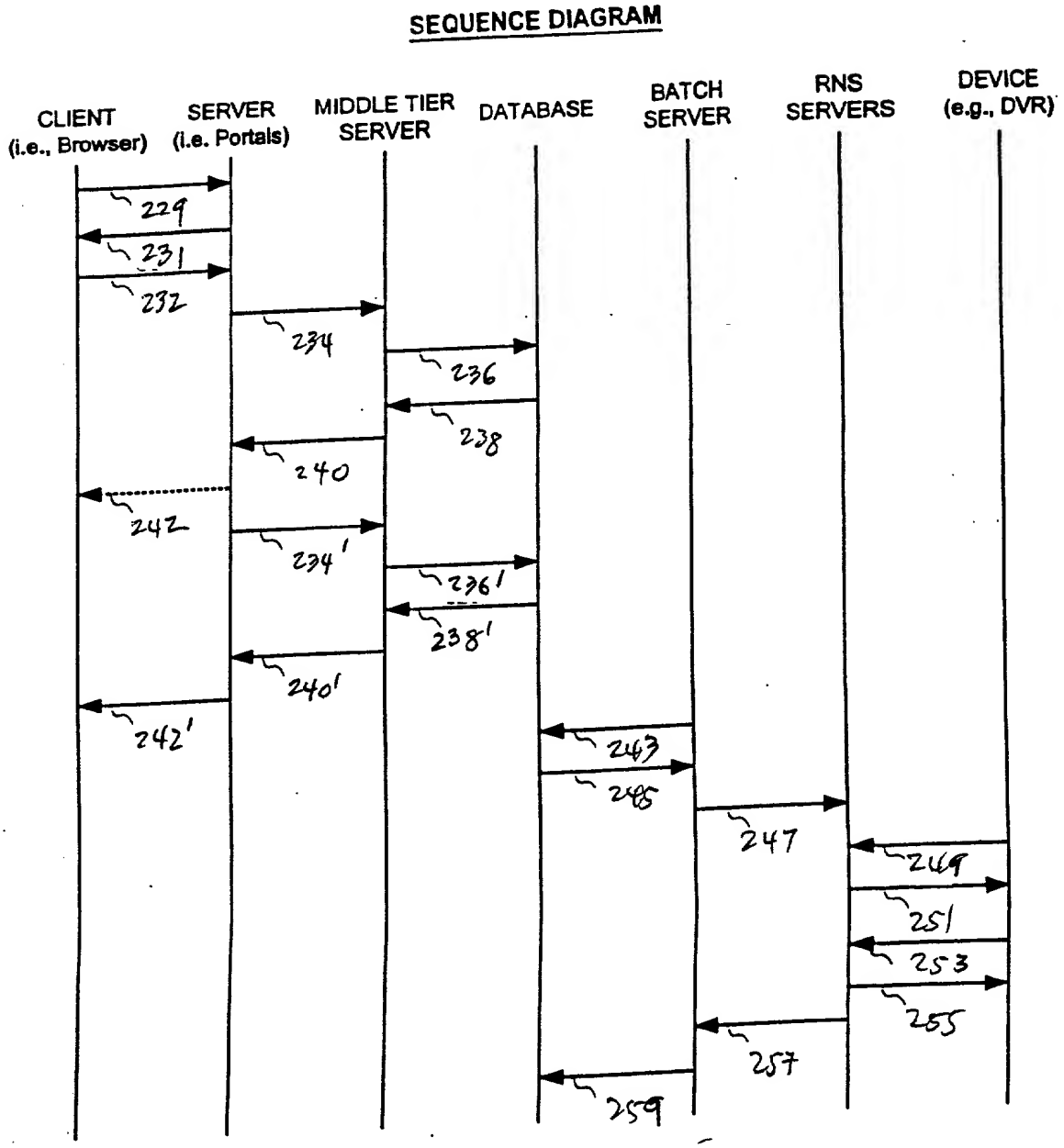

FIG. 13B

API Routine	Function
CreateAccount	Creates an account for a new user based on the information received
Login	Tries to authenticate a user based on the input username and password combination
GetProfile	Returns the profile of the user and his units based on his userid
AddRequest	Adds a request to the unit's list of pending requests based on a set of request parameters, and returns the full status of the unit and of the pending requests, including those for recording specified show(s) and deleting recorded show(s)
DeleteRequest	Delete a request from the user list of pending requests
GetReplayGuide	Returns the Replay Guide of the unit as saved in the appropriate database for the specified unit
GetChannelLineUp	Returns the channel lineup of the unit based on the unit's settings
ChangePassword	Lets the user changes his password
GetEPG	Returns the current electronic program guide for the unit based on the settings of the unit
ShowGuide	Returns detailed information about a specified show or search show details for particular shows based on criteria given as parameters

FIG. 14

Express Mail Label No. EV 339 675 259 US

API Routine	Input Parameters	Output Files (Corresponding XML elements)
CreateAccount	firstname, lastname, address1, address2, city, state, zipcode, serialnumber, login, password, creator	ACCOUNT.XML REPLAYERROR.XML
Login	login, password	ACCOUNT.XML REPLAYERROR.XML
GetProfile	userid	PROFILE.XML (USERINFO, UNITINFO-I) REPLAYERROR.XML
AddRequest	userid, unitid, reqtype(none, show, theme, update) reqtype=show: showtype(single, repeat, manual single, manual repeat), headendid, tmsid, device, starttimegmt, name, durationinminutes, inputsource, quality, guaranteedrecord, numepisodes, weekdayflags, earlystartminutes, showguarminutes reqtype=theme: searchterm, searchflags, suzukid, durationinminutes, quality, guaranteedrecord reqtype=update: updatetype(deleteshow, preserveshow, deletechannel), channelid, showid	UNITSTATUS.XML (UNITINFO, REQUESTSTATUS-I) REPLAYERROR.XML *Note: REQUESTSTATUS Result:=(PENDING, SENT, SUCCESS, GENERAL FAILURE, SCHEDULEFAILURE, ROOMFAILURE)
DeleteRequest	userid, unitid, requestid	DELETERESULT.XML REPLAYERROR.XML
GetReplayGuide	userid, unitid	GUIDE.XML (REPLAYCHANNEL-I) REPLAYERROR.XML *Note: REPLAYCHANNEL Type:=(SINGLE, SINGELMANUAL, REPEAT, REPEATMANUAL, THEME, THEMEEXACT, ZONE)
GetChannelLineUp	userid, unitid	CHANNELLINEUP.XML (CHANNEL-I) REPLAYERROR.XML
ChangePassword	userid, currentpassword, newpassword	ACCOUNT.XML REPLAYERROR.XML
GetEPG	userid, unitid, starttimegmt, durationinminutes, startchannel, channelcount	XML file based on tvguide.dtd & tvprograms.dtd REPLAYERROR.XML
ShowGuide	userid, unitid, query, start, count, levelofdetail *Note: query keywords include actor, advisory, desc, mpaarating, title, etc.	XML file based on tvguide.dtd & tvprograms.dtd REPLAYERROR.XML

FIG. 15

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
Sheet 18 of 37

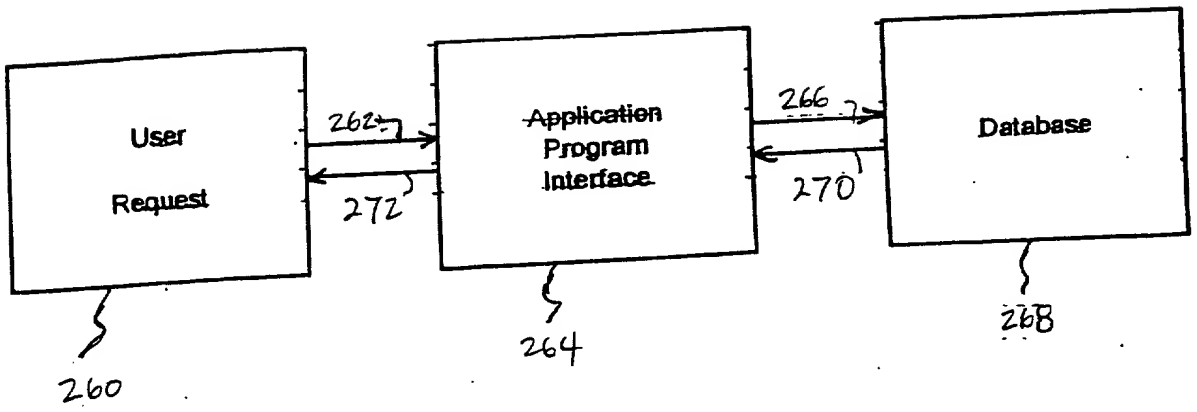
User
Request
262
272
Application
Program
Interface
266
270
Database
260
264
268

FIG. 16A

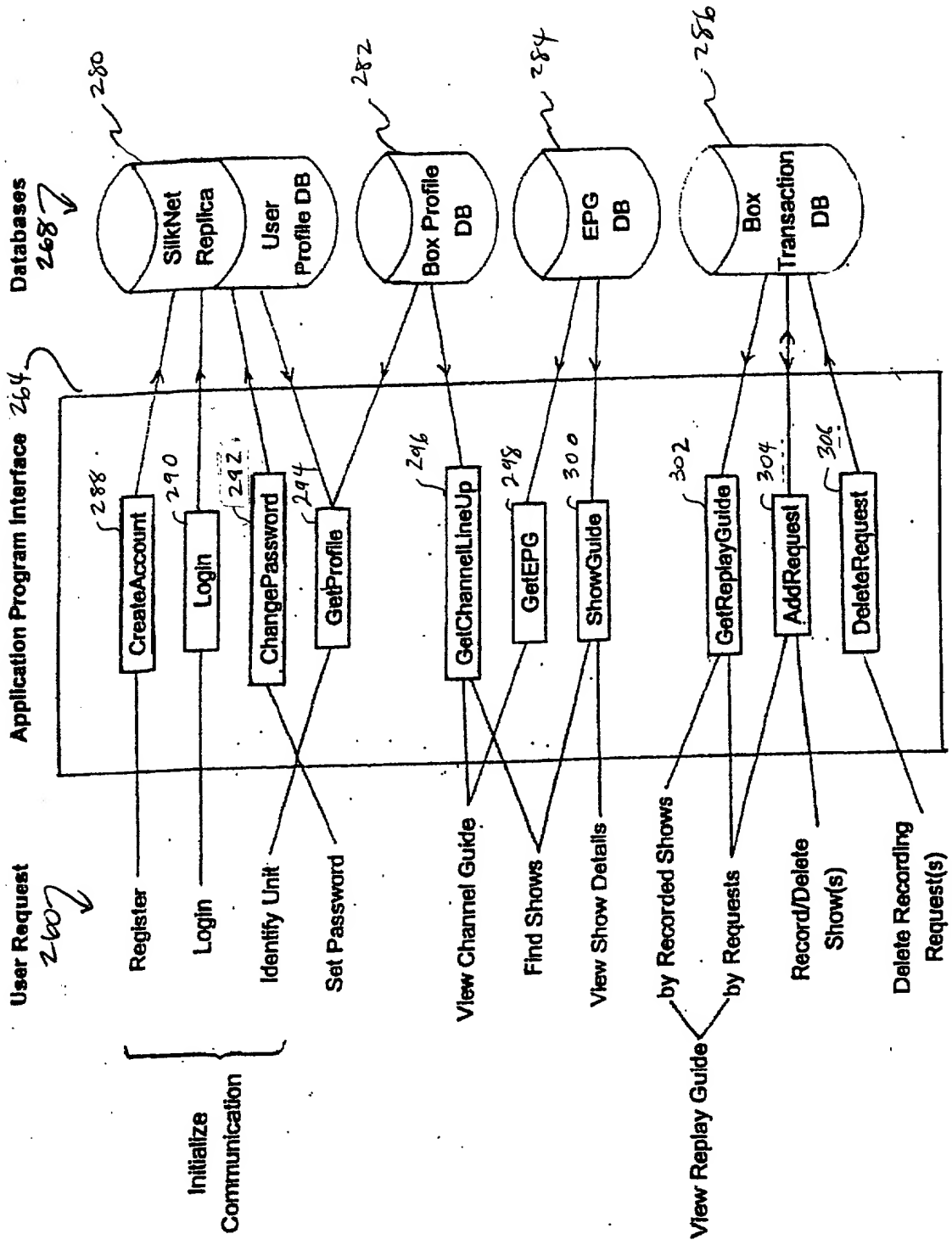
User Request
260
Application Program Interface
264
Databases
268
280
SilkNet Replica
User Profile DB
282
Box Profile DB
284
EPG DB
286
Box Transaction DB
288
CreateAccount
290
Login
292
ChangePassword
294
GetProfile
296
GetChannelLineUp
298
GetEPG
300
ShowGuide
302
GetReplayGuide
304
AddRequest
306
DeleteRequest
Register
Login
Identify Unit
Set Password
View Channel Guide
Find Shows
View Show Details
View Replay Guide by Recorded Shows
View Replay Guide by Requests
Record/Delete Show(s)
Delete Recording Request(s)
Initialize Communication

FIG. 16B

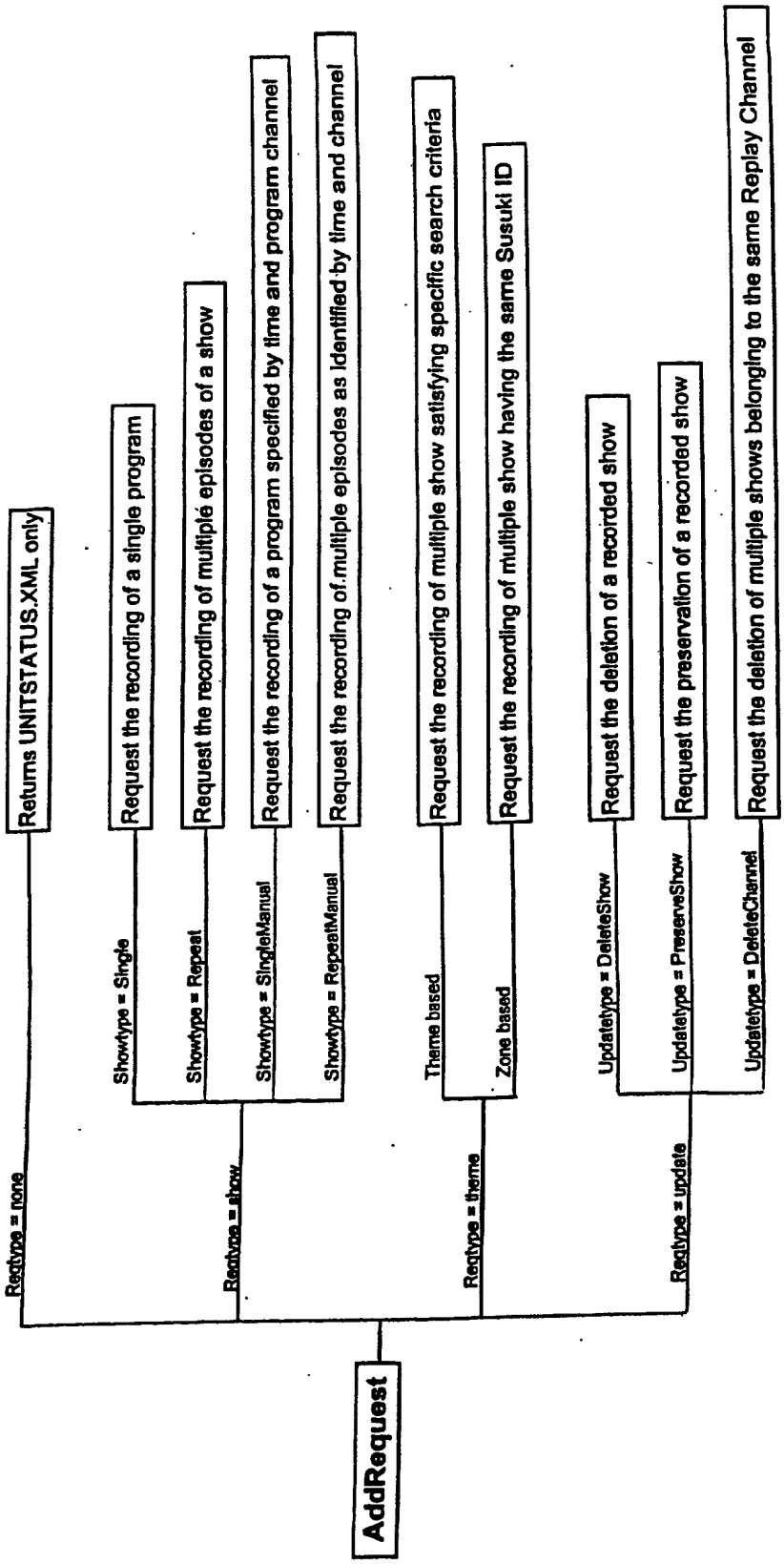
AddRequest
Reqtype = none
Returns UNITSTATUS.XML only
Reqtype = show
Showtype = Single
Request the recording of a single program
Showtype = Repeat
Request the recording of multiple episodes of a show
Showtype = SingleManual
Request the recording of a program specified by time and program channel
Showtype = RepeatManual
Request the recording of multiple episodes as identified by time and channel
Reqtype = theme
Theme based
Request the recording of multiple show satisfying specific search criteria
Zone based
Request the recording of multiple show having the same Susuki ID
Reqtype = update
Updatetype = DeleteShow
Request the deletion of a recorded show
Updatetype = PreserveShow
Request the preservation of a recorded show
Updatetype = DeleteChannel
Request the deletion of multiple shows belonging to the same Replay Channel

FIG. 17

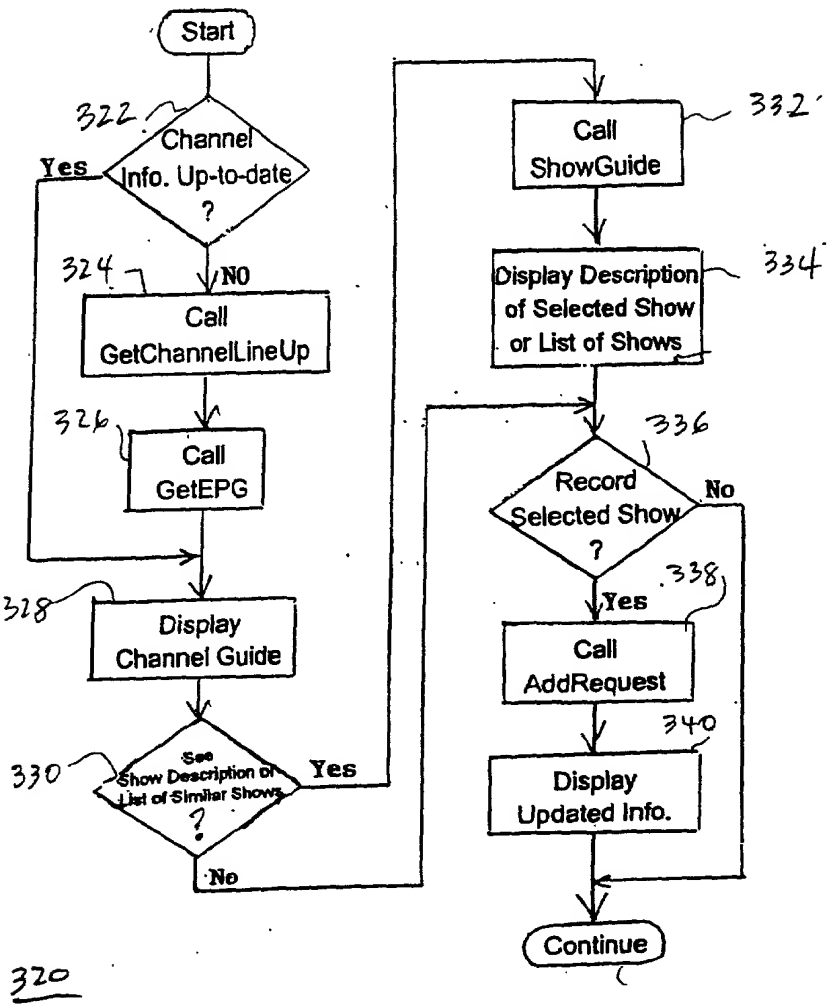
Start
322
Channel Info. Up-to-date ?
Yes
No
324
Call GetChannelLineUp
326
Call GetEPG
328
Display Channel Guide
330
See Show Description or List of Similar Shows ?
Yes
No
332
Call ShowGuide
334
Display Description of Selected Show or List of Shows
336
Record Selected Show ?
No
Yes
338
Call AddRequest
340
Display Updated Info.
Continue
320

FIG. 18

Replay Guide

Replay Shows | Replay Channels

Deleting a channel will delete your to-do list recording Replay TV requests

Delete Selected Channels

Channel	Details	Status	Request Date
☐ A Fistful of Dollars	This single record Replay channel was scheduled to record A Fistful of Dollars from Channel 21(TBS) on Sun, 02/18 at or around 7:00AM - 9:00AM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		02/18
☐ Blown Away	This single record Replay channel was scheduled to record Blown Away from Channel 42(USAP) on Tue, 01/16 at or around 9:00PM - 11:30PM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		01/16
☐ Cantonese News	This show-based Replay channel will continuously record the 1 most current episode(s) of Cantonese News occurring every (Sun, Mon, Tue, Wed, Thu, Fri, Sat) on Channel 8(KTSF) at or around 8:00PM - 9:00PM. Guaranteed at EXTENDED quality.		02/28
☐ Captain January	This single record Replay channel was scheduled to record Captain January from Channel 49(AMC) on Tue, 01/09 at or around 3:30AM - 5:00AM. Guaranteed at EXTENDED quality. Nothing else is scheduled to record.		01/09

FIG. 19A

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
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my replaytv

Preferences | Help | Logout

Channel Guide | Replay Guide | Find Shows | Manual Record

Replay Guide

Replay Shows | Replay Channels

Replay shows and clips recorded or saved on your ReplayTV unit.

Delete Selected Shows

Channel		Show Title/Episode	Date/Time	Station	Duration	Size
A Fistful of Dollars	☐	A Fistful of Dollars	02/18 7:00AM	21 TBS	(2h)	6.46%
Blown Away	☐	Blown Away	01/16 9:00PM	42 USAP	(2h 30m)	8.07%
Captain January	☐	Captain January	01/09 3:30AM	49 AMC	(1h 30m)	4.84%
Firewalker	☐	Firewalker	02/27 8:00PM	21 TBS	(2h)	6.46%
On Deadly Ground	☐	On Deadly Ground	01/07 9:00PM	4 KRON	(2h)	6.46%
Platoon	☐	Platoon	02/04 8:00PM	37 TNTP	(2h 30m)	8.07%
The Bridge on the River Kwai	☐	The Bridge on the River Kwai	12/24 8:00AM	42 USAP	(3h 30m)	11.30%
The Little Princess	☐	The Little Princess	12/26 4:15AM	49 AMC	(1h 45m)	5.65%
The Trouble With Harry	☐	The Trouble With Harry	12/18 1:05PM	49 AMC	(1h 55m)	6.19%
Welcome to ReplayTV	☐	Welcome to ReplayTV	09/08 10:49AM		(15m)	2.42%

FIG. 19B

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
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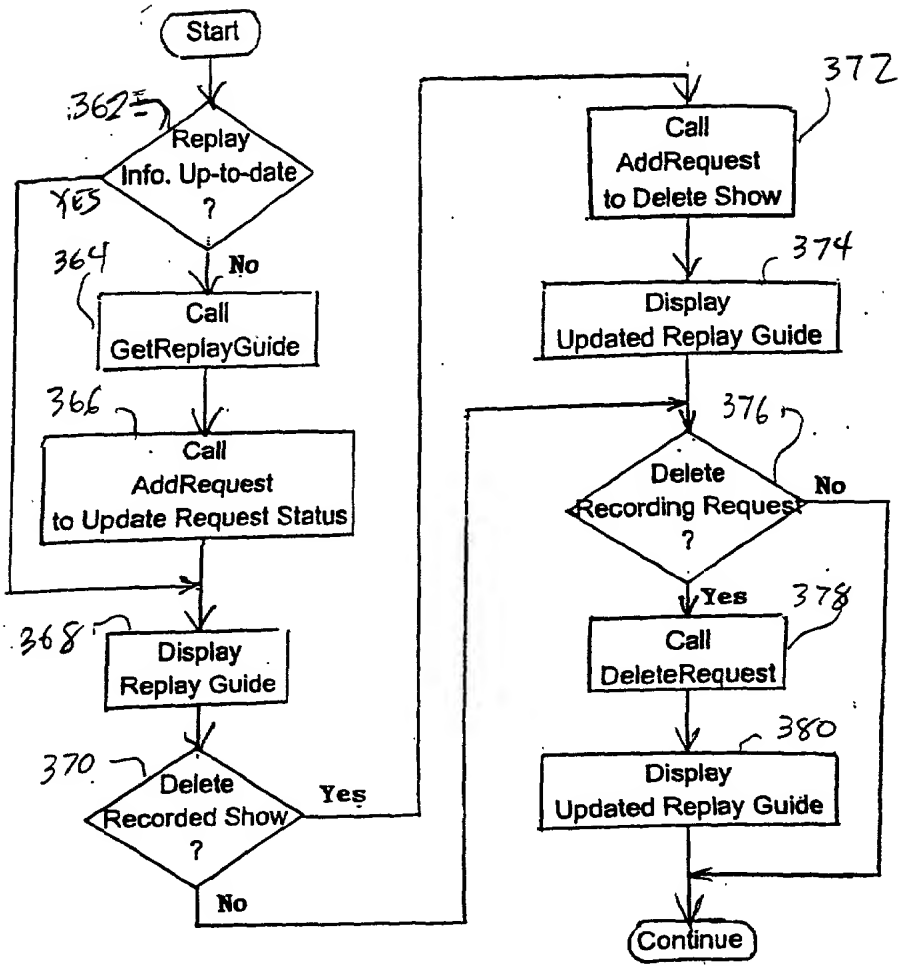
Start
362
Replay Info. Up-to-date ?
YES
No
364
Call GetReplayGuide
366
Call AddRequest to Update Request Status
368
Display Replay Guide
370
Delete Recorded Show ?
Yes
No
372
Call AddRequest to Delete Show
374
Display Updated Replay Guide
376
Delete Recording Request ?
No
Yes
378
Call DeleteRequest
380
Display Updated Replay Guide
Continue
360

FIG. 20

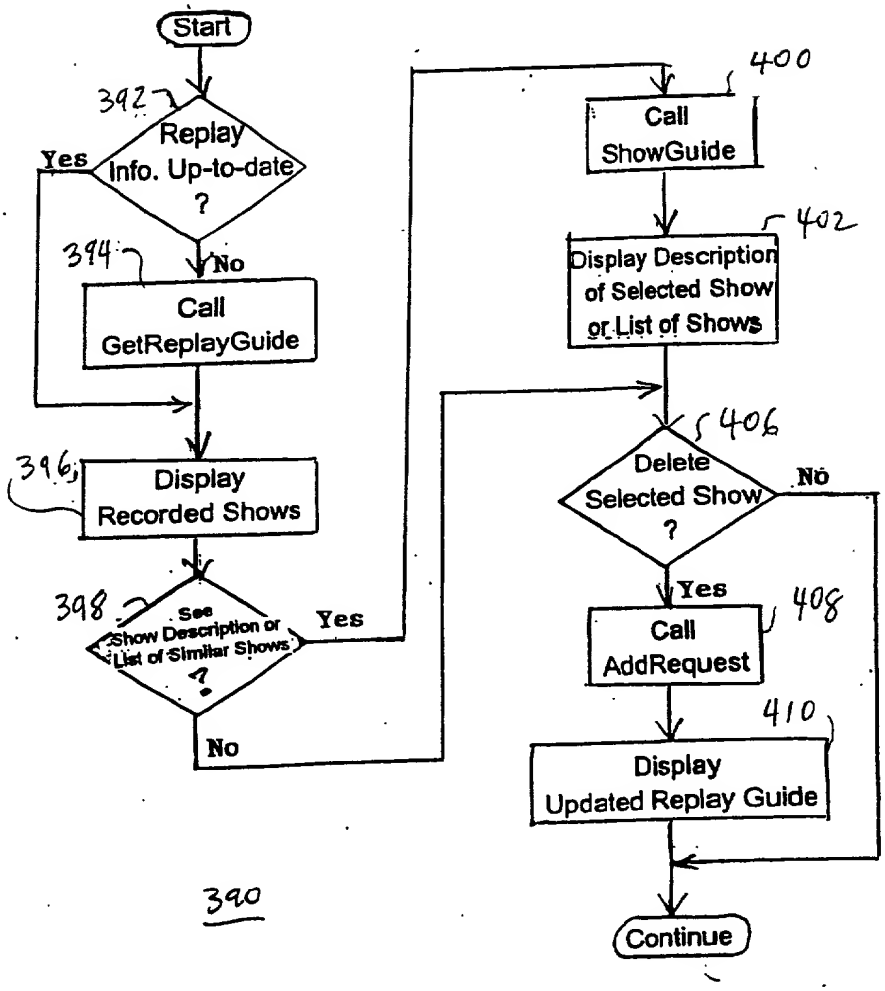
Start
392
Replay Info. Up-to-date ?
Yes
No
394
Call GetReplayGuide
396
Display Recorded Shows
398
See Show Description or List of Similar Shows ?
Yes
No
390
400
Call ShowGuide
402
Display Description of Selected Show or List of Shows
406
Delete Selected Show ?
No
Yes
408
Call AddRequest
410
Display Updated Replay Guide
Continue

FIG. 21

Copyright Policy | Terms And Conditions | Privacy Policy | FAQ

FIG. 22

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
Sheet 27 of 31

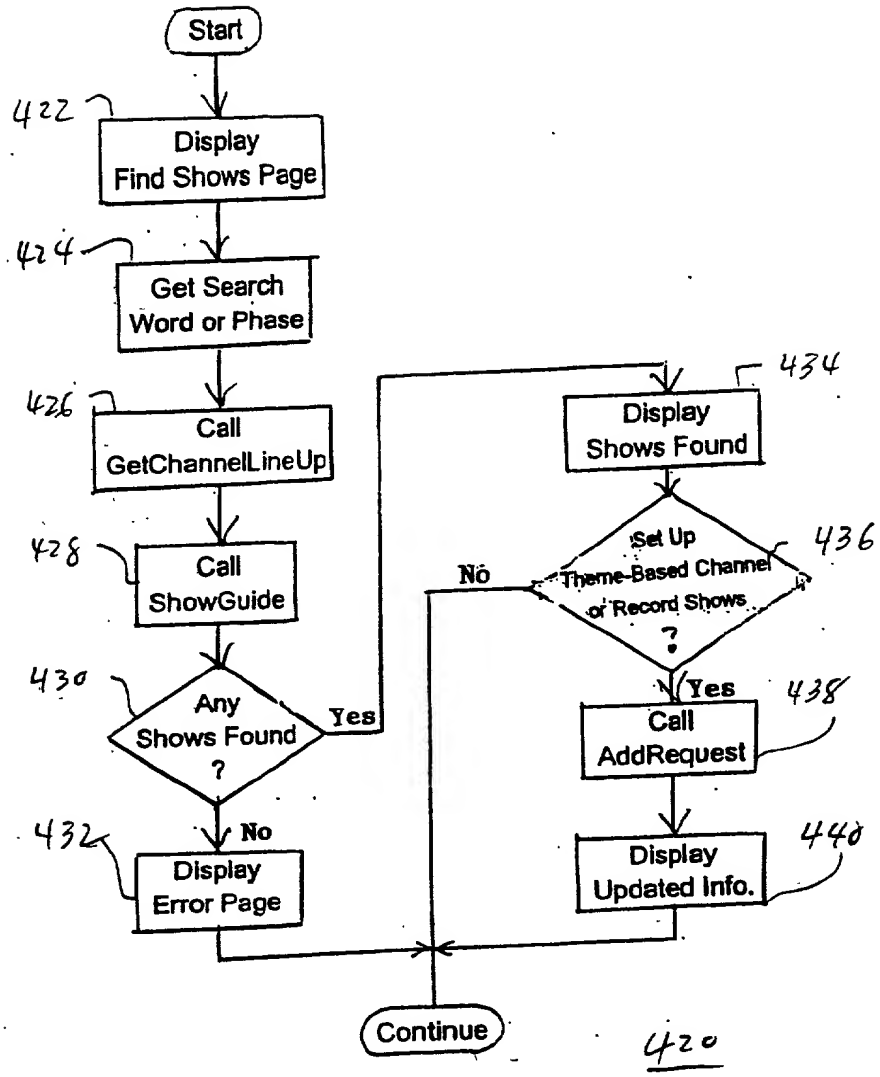
Start
422
Display Find Shows Page
424
Get Search Word or Phase
426
Call GetChannelLineUp
428
Call ShowGuide
430
Any Shows Found ?
Yes
No
432
Display Error Page
434
Display Shows Found
436
Set Up Theme-Based Channel or Record Shows ?
No
Yes
438
Call AddRequest
440
Display Updated Info.
Continue
420

FIG. 23

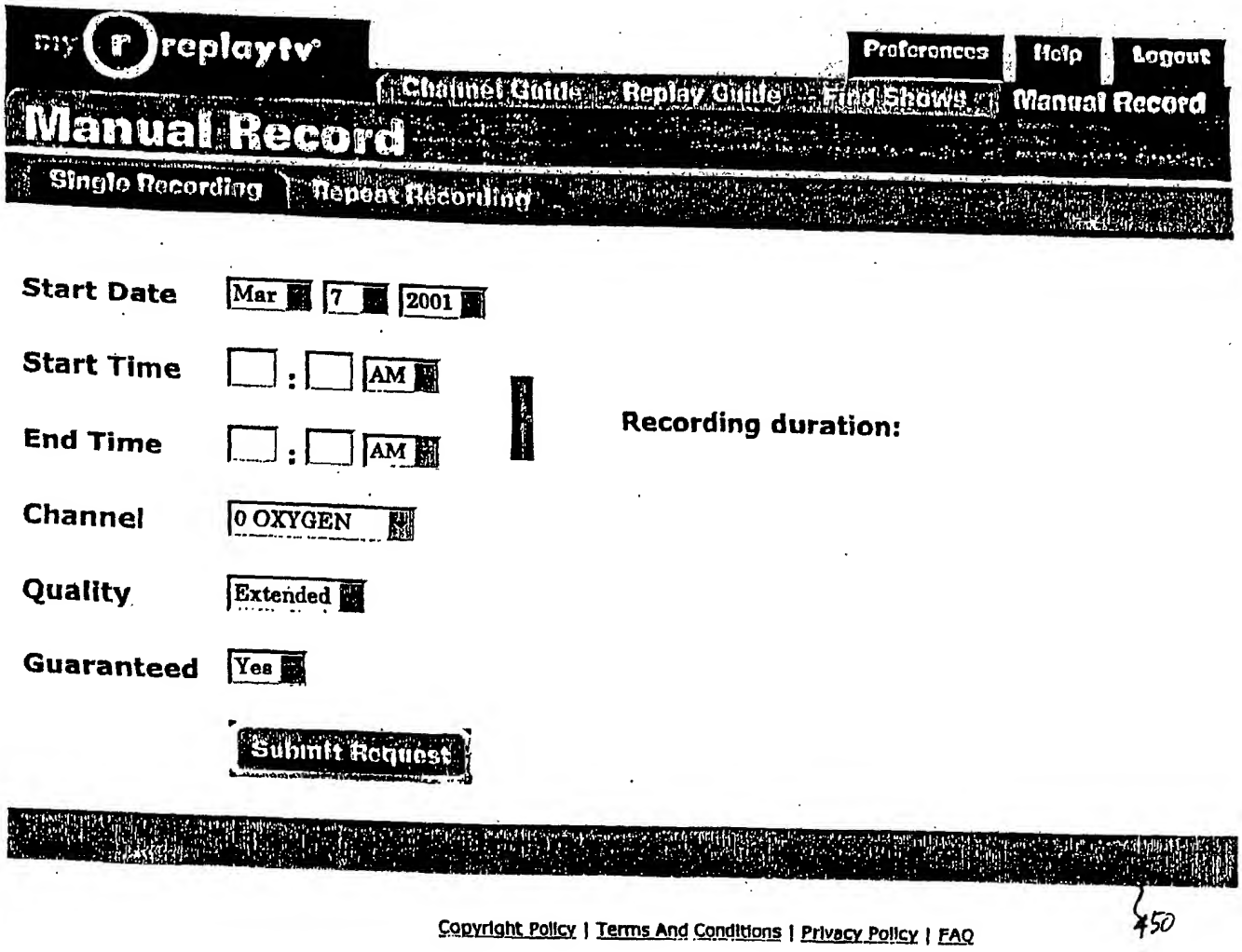

FIG. 24A

Title: "Method and System For Remote Television Replay"
Application No.: Not Yet Assigned
Inventors: Millard E. Sweatt, III, et al.
Atty. Docket No.: 22407-05391; Case 5391 US
Sheet 29 of 37

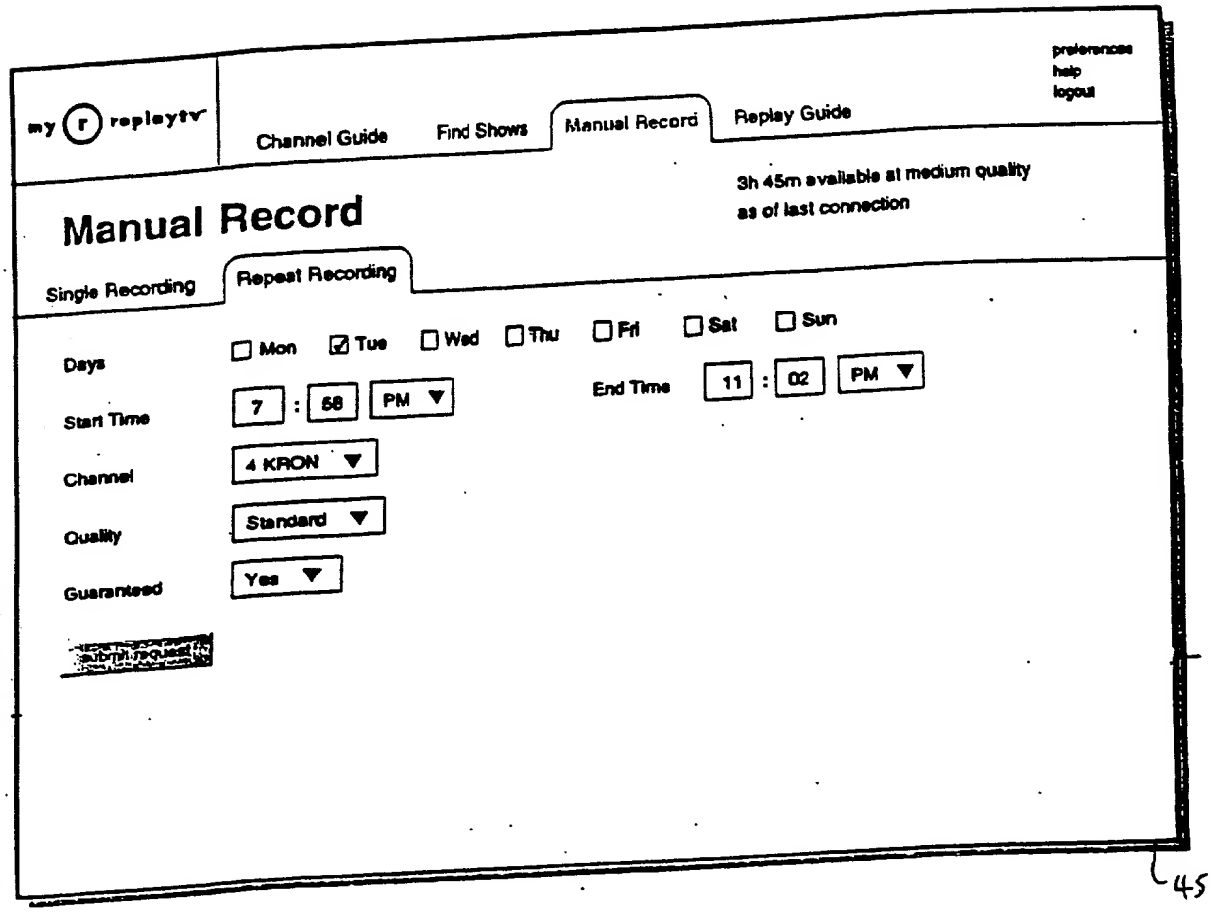

FIG. 24B

EXPRESS MAIL NO. EV 339155 525 US

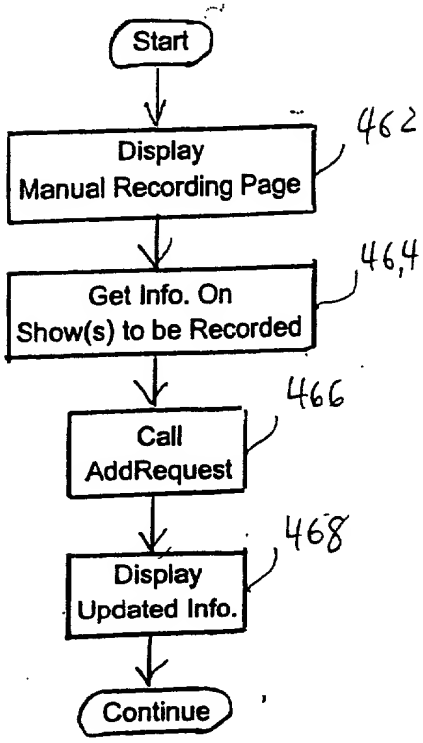
Start
Display Manual Recording Page
462
Get Info. On Show(s) to be Recorded
464
Call AddRequest
466
Display Updated Info.
468
Continue
460

FIG. 25

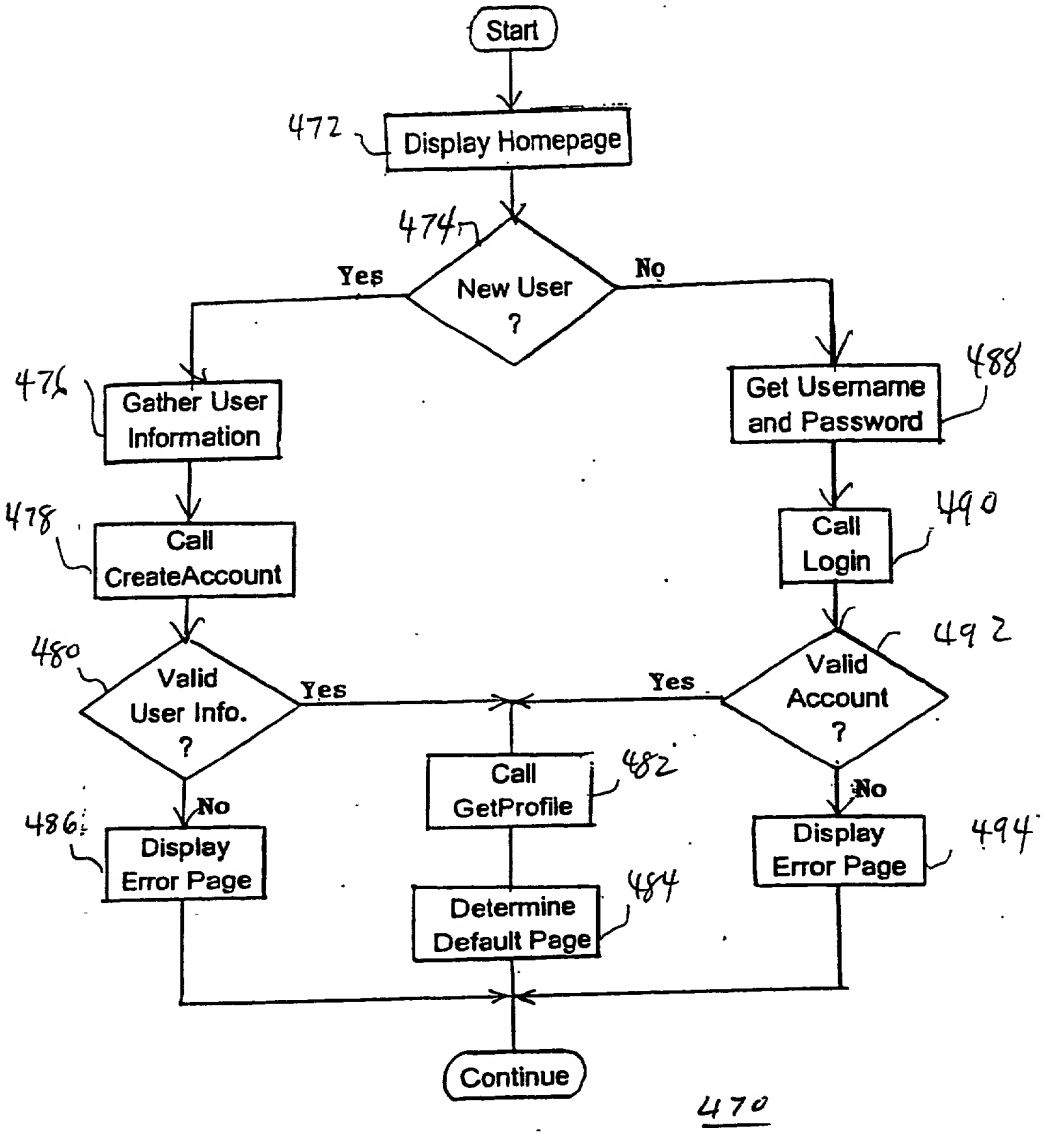
Start
472
Display Homepage
474
New User ?
Yes
No
476
Gather User Information
478
Call CreateAccount
480
Valid User Info. ?
Yes
No
486
Display Error Page
Call GetProfile
482
Determine Default Page
484
488
Get Username and Password
490
Call Login
492
Valid Account ?
Yes
No
494
Display Error Page
Continue
470

FIG. 26

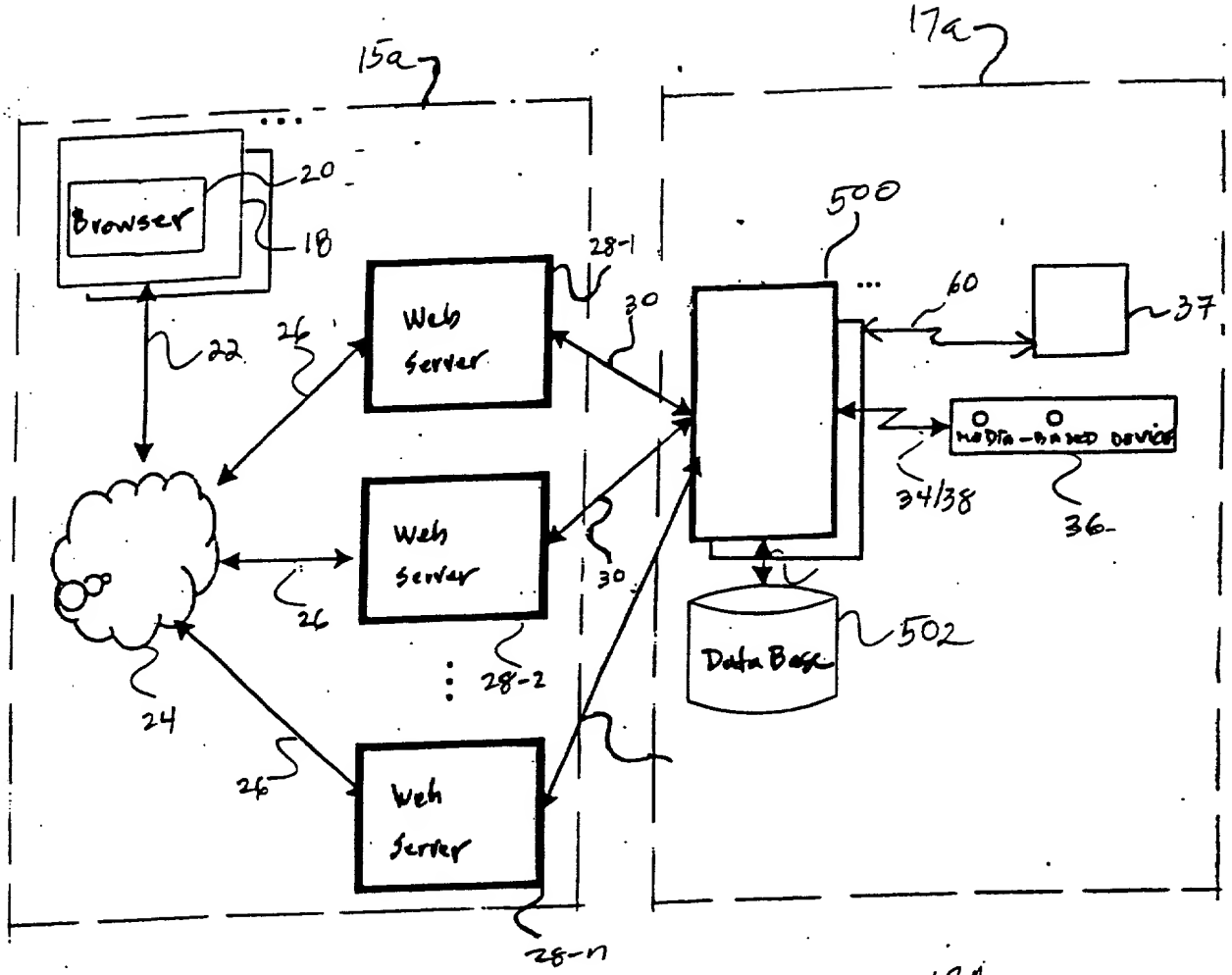
15a
17a
Browser
20
18
22
26
Web Server
28-1
30
500
60
37
Media-Based Device
34/38
36
Web Server
30
26
28-2
Data Base
502
24
26
Web Server
28-n
19A

FIG. 27

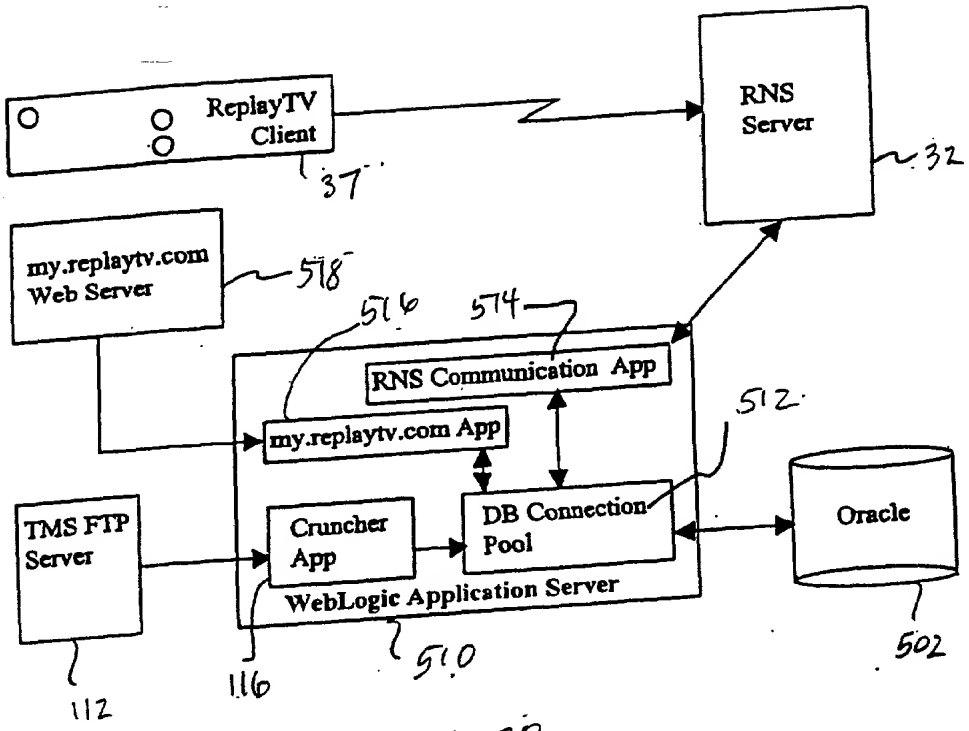
ReplayTV Client
37
RNS Server
32
my.replaytv.com Web Server
518
516
514
RNS Communication App
my.replaytv.com App
512
TMS FTP Server
Cruncher App
DB Connection Pool
Oracle
WebLogic Application Server
510
502
112
116

FIG. 28

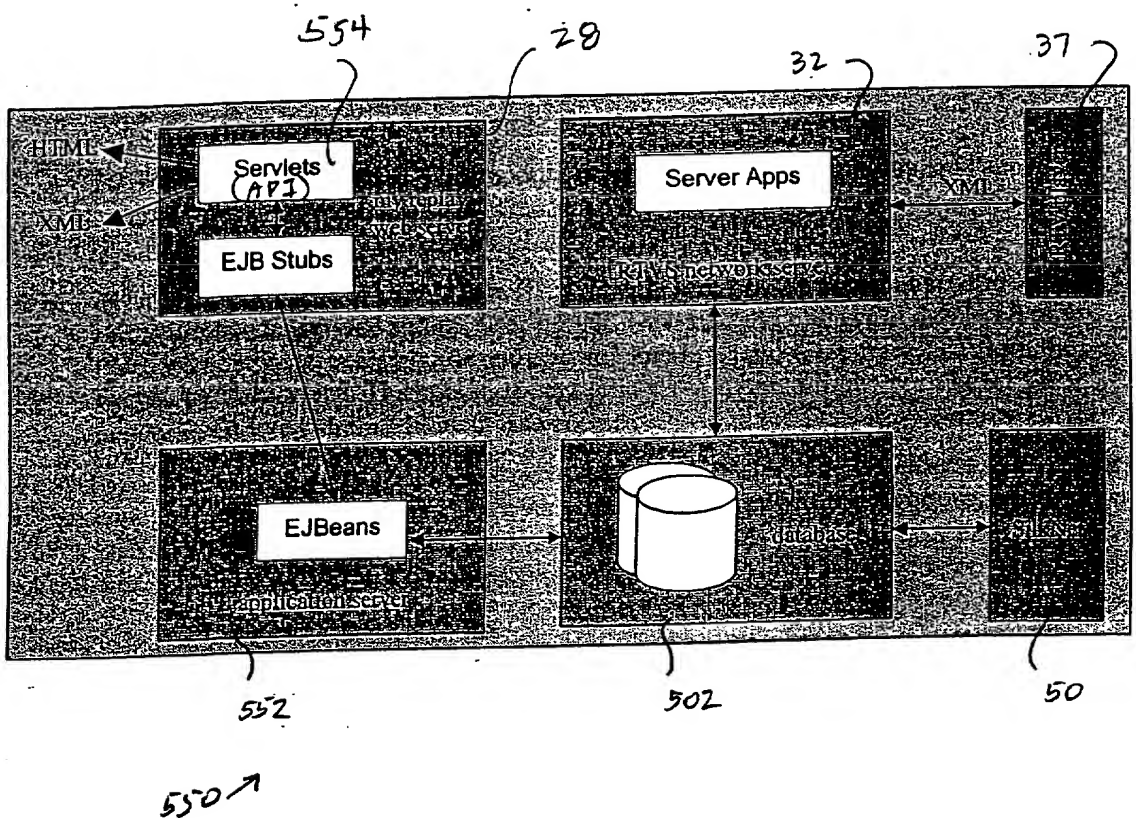
554
28
32
37
HTML
XML
Servlets
(API)
EJB Stubs
Server Apps
XML
EJBeans
database
552
502
50
550

FIG. 29

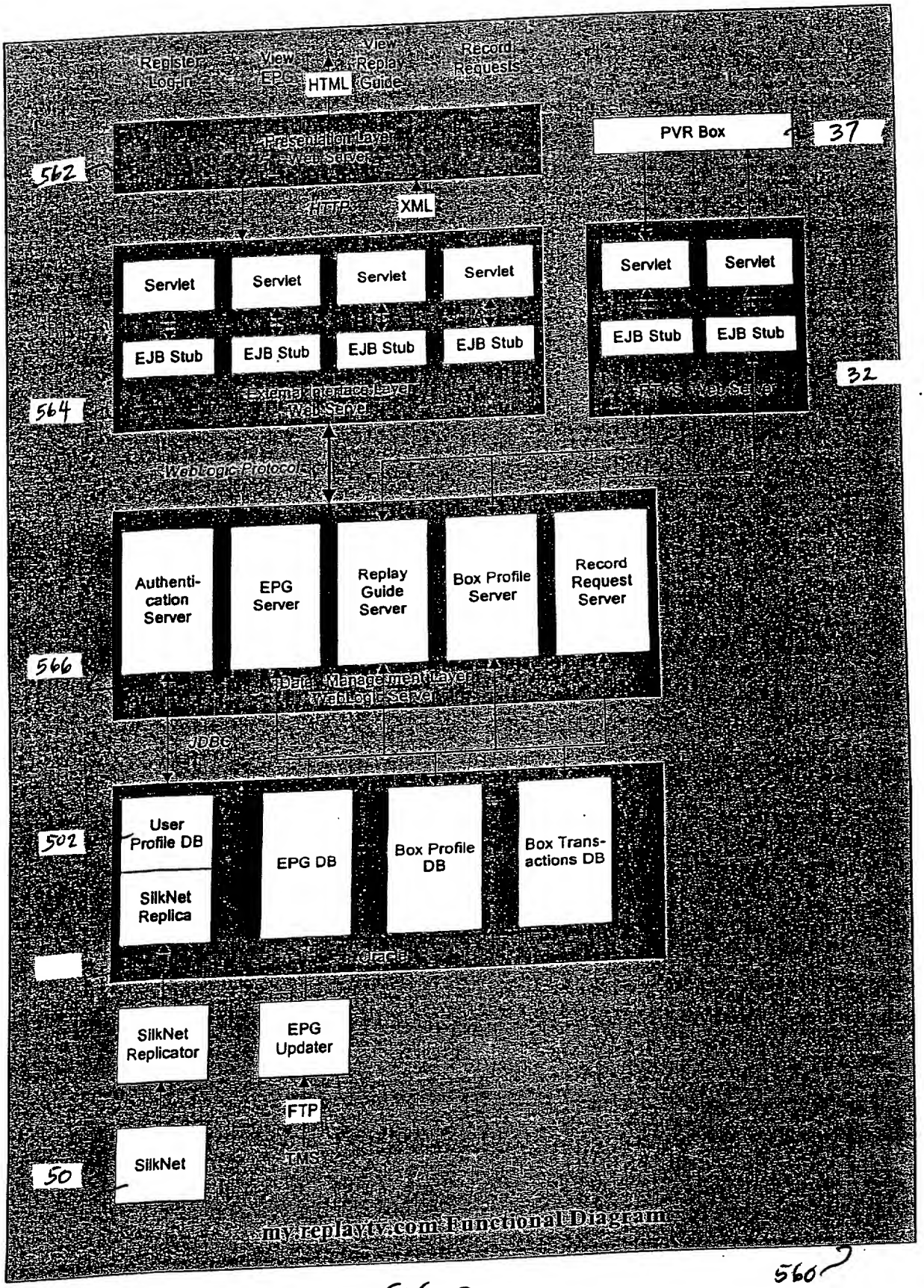
Register
Log-in
View EPG
HTML
View Replay Guide
Record Requests
PVR Box
37
562
Presentation Layer
Web Server
HTTP
XML
Servlet
Servlet
Servlet
Servlet
EJB Stub
EJB Stub
EJB Stub
EJB Stub
Servlet
Servlet
EJB Stub
EJB Stub
32
564
External Interface Layer
Web Server
WebLogic Protocol
Authenti-cation Server
EPG Server
Replay Guide Server
Box Profile Server
Record Request Server
566
Data Management Layer
WebLogic Server
JDBC
User Profile DB
SilkNet Replica
EPG DB
Box Profile DB
Box Trans-actions DB
502
Oracle
SilkNet Replicator
EPG Updater
FTP
TMS
SilkNet
50
my.replaytv.com Functional Diagram
560

FIG 30

EXPRESS MAIL NO. EV 325560 US

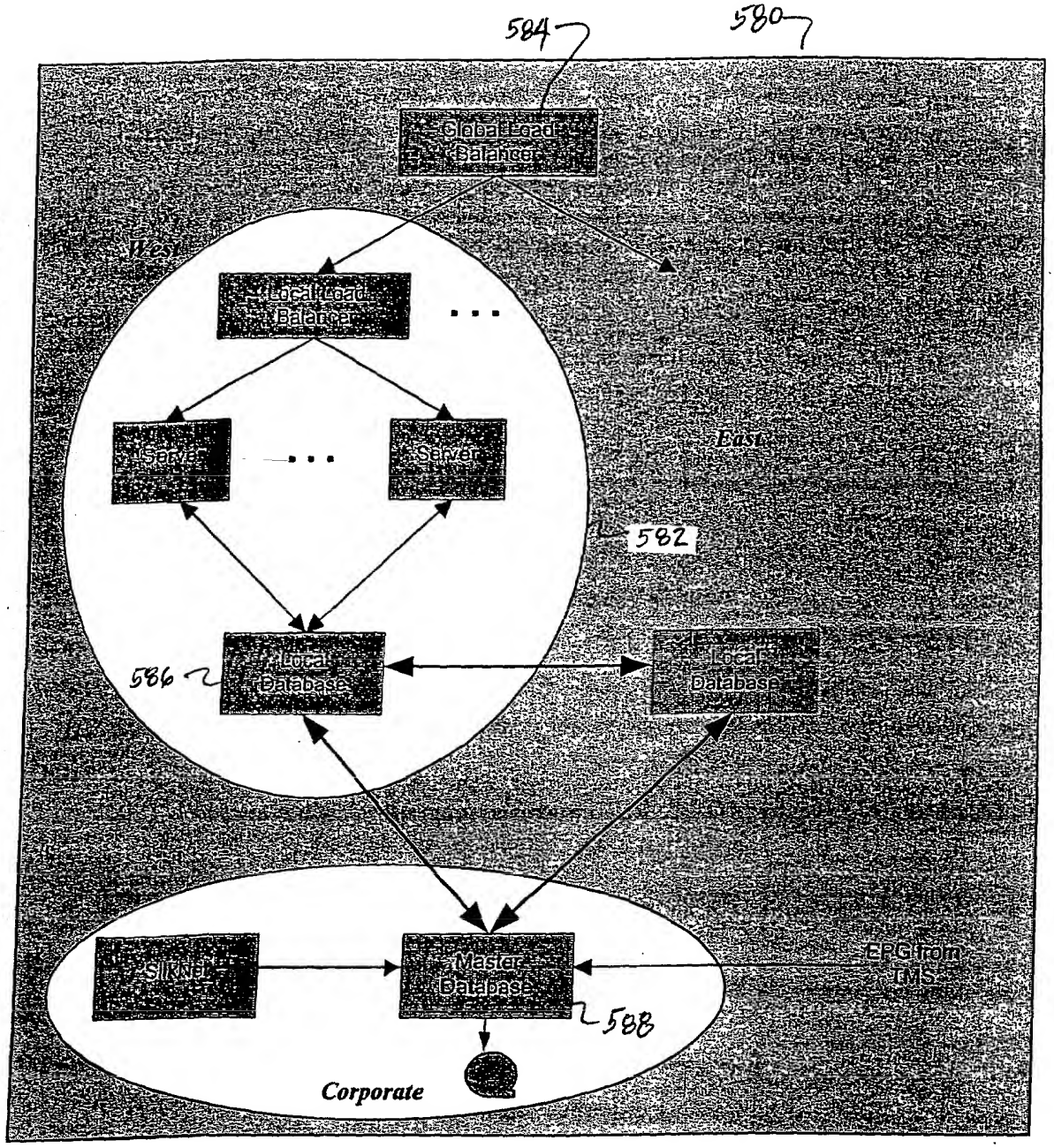

FIG. 31